

ANNUAL MEETING, BOARD OF DIRECTORS

JANUARY 1986

Doc. # 24

REPORT OF THE AD HOC COMMITTEE ON AMATEUR RADIO DIGITAL COMMUNICATION

The number of terminal-node controllers (TNCs) has now exceeded 10,000 by two independent counts. Below are known and estimated quantities shipped to date by manufacturer:

Kantronics	3400	assembled and tested
TAPR TNC 1	2500	kits
Heathkit	1500?	kits
TAPR TNC 2	800?	kits
AEA PK-64	650?	assembled and tested
VADCG	500	kits
GLB	500?	assembled and tested
Ashby & Son	150?	kits
Packeterm	200?	assembled and tested
MFJ	0?	to begin shipment soon

Est. Total:	10200	

This should be contrasted with just over 4000 TNCs early in 1985.

It is easy to see why the number one problem has become congestion of existing packet-radio channels. In early 1985, there were only a few locations where congestion was notable on a single 2-meter channel such as 145.01 MHz which operates at 1200 bit/s. With the above quantities, there has been some division of the load to other 2-meter channels such as 145.03, .05, .07, and .09. Also, there are ongoing efforts to move some inter-digipeater and CBMS-to-digipeater links to 220 MHz and increase speed to 9600 bit/s. It has been commonly held that the lack of a network-layer protocol is what is holding things up. The reality is that if we had a network protocol now, that would simply add network-layer overhead to congested channels.

The Ad Hoc Committee of Amateur Radio Digital Communication met on December 7 and 8, 1985, at ARRL HQ. There was general agreement that an increase to 9600 bit/s for intercity links would alleviate congestion only for a year or so. Moving higher in frequency where more space is available and dramatically increasing speed to (say) 56 kbit/s is needed. Presently, there are no suitable digital radios for speeds of 9600 bit/s and greater for the 220-MHz band and above. The Committee decided to ask the VHF/UHF-experimenter community for help designing a 28-MHz RF modem that could be used with existing transverters. In addition to asking VHF/UHFers in the US, we have invited RSGB to consider such a project as their contribution to packet radio.

The Committee considered progress made on development of candidate network- and transport-layer protocols and hardware:

Phil Karn, KA9Q, has completed code for all but one software module needed to operate the TCP/IP datagram protocols.

Terry Fox, WB4JFI, reported that Howie Goldstein, N2WX, has written working software to support AX.25 virtual-circuit network protocol. AMRAD is testing this code and writing network and transport protocols in "C" on an IBM PC.

Lyle Johnson, WA7GXD, showed a prototype network-node controller (NNC) with 4 packet ports and 2 parallel ports.

Both of the above protocols and the TAPR NNC are expected to be ready for public demonstration at the Fifth ARRL Amateur Radio Computer Networking Conference in March.

Eric Scace, K3NA, made a detailed presentation of a proposed network protocol based on CCITT Recommendation Q.921, part of the Integrated Services Digital Network (ISDN) protocols.

The Committee considered some minor refinements in the AX.25 link-layer protocol. These changes will not cause incompatibility problem with version 2.0 and are not of sufficient magnitude for ARRL Board consideration.

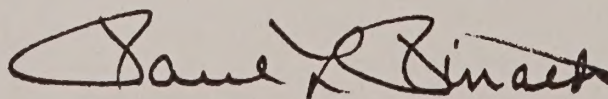
Preparations for the Fifth ARRL Amateur Radio Computer Networking Conference were discussed. It was agreed that the Conference will be held on Sunday, March 9, 1986, from 8 AM to 4:30 PM at the Orlando Hamcation. The Committee meeting is scheduled for Saturday, March 8, at 3 PM. The FADCA/SOUTHNET tutorial and demonstration will take place on Saturday morning. There are two hotel arrangements:

Howard Johnson's Executive Center Hotel - downtown, Rte 50 and I-4, Orlando. Tel: 305-843-8770. Special rates: \$36 per night per room (maximum 4 persons per room).

Comfort Inn Downtown, 720 S Orange Blossom Trail (at the East-West Expressway), Orlando. Tel: 305-841-0788. Special rates: \$25 per night per room (maximum 4 persons per room).

Mention Orlando Hamcation when making reservations to get these special rates.

Respectfully submitted,



Paul L. Rinaldo, W4RI
Chairman

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

RECEIVED

In the Matter of

Creation of a New Radio
Class and Allocation of
Spectrum for the Owners
of Personal Computers

)
) JAN 6 1986
) RM-5241
) FCC
) Office of the Secretary.

COMMENTS OF
THE AMERICAN RADIO RELAY LEAGUE, INCORPORATED

The American Radio Relay League, Incorporated (the "League"), the national association of amateur radio operators licensed by the Commission, hereby respectfully submits its Comments in response to the "Proposal for Creation of The Public Digital Radio Service" (the "Petition") constituting a petition for rule making filed by Donald L. Stoner October 31, 1985.^{1/} In opposition to that portion of the Petition which suggests the reallocation of the band 52-54 MHz from the Amateur Radio Service to a new computer hobbyist radio service, the League states as follows:

1. The League is opposed to the creation of a new personal radio service for computer hobbyists on the grounds that:

- (a) the Amateur Radio Service already provides for communications between computers using packet radio, thus another radio service is unnecessary;

^{1/} Public Notice of the Petition was given December 5, 1985. Thus, these Comments are timely filed.

- (b) the Amateur Radio Service has the technical capability necessary for the orderly development of a data-communications network capable of handling the types and volumes of traffic which may be presented by the computer hobbyists; and
- (c) the Amateur Radio Service has the infrastructure and discipline needed for long-term viability of personal computer communications.

What the League most strongly objects to, however, is the proposed reallocation of 2 MHz--fully half--of the amateur 6-meter band (52-54 MHz) to this proposed new service without any quantified need established therefor. The same would deprive the Amateur Radio Service of valuable spectrum without any justification, based on an erroneous premise that the band is underutilized.

2. Petitioner makes a number of assumptions which lead to his suggestion that the 52-54 MHz band be reallocated from the Amateur Radio Service to his proposed computer hobbyist radio service. In addition to assuming the popularity of such a service in the first place, and failing to discount those computer hobbyists satisfied with amateur radio digital communications and/or telephone modem computer communications, Petitioner assumes (1) that shared spectrum is unacceptable, due to interference from voice communications; (2) that channelization is not desirable; (3) that wideband digital communications are necessary; and (4) that, in order to keep the cost of equipment low, frequencies between 30 and 300 Mhz should be used.

3. The above assumptions made, Petitioner concludes that a 2 MHz bandwidth is necessary for such communications, and that the 52-54 MHz band is ideal because it is "virtually unoccupied and therefore unused." Specifically, Petitioner states that:

Radio amateurs are permitted to operate on frequencies between 50 and 54 MHz (the six meter band). For a number of reasons, this band is "underoccupied". It is estimated that out of 400,000 radio amateurs in the United States, less than 1,000 are active on the six meter band.

Due to the potential for interference with adjacent television channel 2 (54-60 MHz), virtually all six meter users operate between 50 and 52 MHz. For all practical purposes the spectrum between 52 and 54 MHz is wasted.

4. Petitioner is wrong. His claim that "less than 1,000 amateur stations are active on the band" is utterly unsupported and demonstrably untrue. The 50-54 MHz band, allocated throughout ITU Regions 2 and 3 and in some countries in Region 1 to the Amateur Radio Service,^{2/} is well utilized. Attached hereto as Exhibit A is a list of FM repeaters known by the League to be coordinated and operational with input or output frequencies, or both, in the 52-54 MHz range. There are presently 250 such repeaters in the continental United States and at least one in almost every state. The League's Repeater Directory lists the amateur 50-54 MHz band plan which is observed throughout the

^{2/} In Region 2, including the United States, the allocation is on an exclusive basis.

amateur community. The 52-54 MHz segment is reserved for FM repeater and simplex operation and is increasingly used for that mode of operation. The band plan provides a maximum of 47 repeater pairs using 1 MHz separation between the input and output frequencies and 20 kHz channel separation.

5. In 1971, the League had registered in its Repeater Directory only 58 repeaters operating in the 52-54 MHz band. By 1978 that number had tripled, totalling 169. The steady, regular growth of the number of repeaters in that band, now totalling 250, renders the conclusion of the Petitioner that the band is "unused" absurd.

6. In a single weekend in June 1985, a single station participating in the ARRL June VHF QSO Party contacted 523 other amateur stations in the 50 MHz band, although propagation was limited to less than one-fourth of the country and a high percentage of stations active on the band did not participate in the contest.

7. Amateur packet radio operation is rapidly developing; it is extremely popular and, as mentioned above, provides a forum for the type of communications proposed by Petitioner. More significantly, however, amateur packet radio operation is conducted successfully on far narrower bandwidths than that proposed by Petitioner. While it is true that the wider the bandwidth the greater the transmission speed possible, normal 1200 baud transmission rates used in amateur packet communications today require (roughly) only 16 kHz. Amateurs are beginning to operate at 9600

baud within a 20 kHz bandwidth. With further development of modems, amateurs can be expected to be able to operate at speeds in the 16- to 19.2-kilobit per second range within a 20-kHz channel. Thus, under no circumstances would the radio service proposed by Petitioner justify the allocation of more than 30 kHz of spectrum. The suggestion that such a service (assuming arguendo that a separate service is justified) should be allocated 2 MHz of amateur spectrum is absurd.

8. It is noteworthy that the Petitioner has failed to establish a prima facie need for a new radio service for computer hobbyists.^{3/} At Page 20 of his Petition, it is stated that: "In response to this petition, the Commission may point out that there has been no popular 'groundswell' to create a computer radio service." This is quite true because the alleged need for such a service is presently satisfied by both the Amateur Radio Service and telephone modem computer services. It is thus impossible to understand how Petitioner can then conclude that to deprive the Amateur Radio Service of 2 MHz of spectrum would "benefit the majority at the expense of the minority." The only possible disincentive in computer hobbyists using the already available amateur radio bands for their data communications is

^{3/} Risking an accusation of "argumentum ad hominem," it is noteworthy that the entire Petition is no more than an unsupported series of conclusory musings of the Petitioner. There is not one iota of ascertained need for either the proposed service or, therefore, for the allocation of spectrum therefor.

the Morse code requirement. However, in the case of the 50 MHz band and above, only a 5-WPM code requirement exists.

9. The League wishes to point out that there has been a remarkable growth in amateur packet radio over the past few years since the Commission so wisely amended the Part 97 rules to make it possible. Packet radio in the Amateur Radio Service now stands at about 10,000 units in the field, in contrast to around 4,000 in early 1985. The Commission has already created a radio service to satisfy the need, and amateurs have responded seriously and enthusiastically. Why create another radio service on unsubstantiated conjecture and take frequencies away for the Amateur Radio Service, which is already doing the job?

THEREFORE, the foregoing considered, the American Radio Relay League respectfully requests that the instant Petition for Rule Making be denied to the extent that it proposes the reallocation of 2 MHz of valuable amateur radio spectrum which is utilized by the Amateur Radio Service for a new service of unspecified interest.

Respectfully submitted,

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Newington, CT 06111

THE AMERICAN RADIO RELAY
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By: Christopher D. Imlay (for)
Christopher D. Imlay,
Its Counsel

January 6, 1985

CITY.....	STATE. CODE	INPUT..	OUTPUT.	R. CALL
Hayden	AL	52. 010	53. 010	N4CCG
Fort Payne	AL	52. 830	53. 830	K84CVN
Black Canyon City	AZ	52. 760	53. 760	K7BDC
Placerville	CA	52. 760	52. 100	WA6ZNM
Palo Escrito	CA	52. 760	52. 100	WB6NVH
*Palmdale	CA	52. 760	52. 160	WB6TTS
*Lake Hughes	CA	52. 860	52. 260	N69KL
*Thousand Oaks/Castro Peak	CA	52. 860	52. 280	WB6CHI
*Oat Mt.	CA	52. 920	52. 320	K6FG
Mt. Soledad	CA	52. 940	52. 340	WB6IPT
Mt. Wilson	CA	52. 760	52. 325	WA6ZDI
Johnstone Peak	CA	52. 200	52. 525	WA6UJS
King City	CA	449. 975	52. 525	W6LID
Lake Ridge	CA	53. 160	52. 560	WB6EUG
Grizzly Peak	CA	53. 160	52. 560	WA6EUI
San Diego	CA	52. 380	52. 600	WB6AOT
Mt. Delux	CA	53. 180	52. 600	WA6SEK
Orange Co.	CA	52. 840	52. 620	W6KRW
Mt. Vaca	CA	53. 220	52. 620	WA6PTT
Mt. Bielawski	CA	53. 240	52. 640	WB6FFC
Mt. Allison	CA	53. 260	52. 660	WA6HIA
Shasta Baldy	CA	53. 260	52. 660	WA6PEO
Los Angeles	CA	52. 900	52. 680	WA6MDJ
Stanford Hills	CA	53. 280	52. 680	AD6ZL
Stockton	CA	53. 320	52. 720	WA6SEK
Mt. Vaca	CA	53. 340	52. 740	N6BPK
Bristol	CT	52. 010	53. 010	WA1LMV
Granby	CT	52. 030	53. 030	KA1AVJ
Naugatuck	CT	52. 150	53. 150	WA1NGP
North Coventry	CT	52. 420	53. 420	K1JCL
Granby	CT	53. 830	223. 600	KA1AVJ
Alexandria, VA	DC	52. 130	53. 130	WA4CCF
Wheaton, MD	DC	52. 250	53. 250	WB3DBU
Wheaton, MD	DC	144. 950	53. 250	WB3DBU
Wheaton, MD	DC	52. 250	144. 950	WB3DBU
Dover	DE	52. 820	52. 620	KA3IDN
Gainesville	FL	52. 010	53. 010	WB4FSQ
Orlando	FL	52. 010	53. 010	KC4CI
St. Petersburg	FL	52. 030	53. 030	KA2ECA
Miami	FL	52. 030	53. 030	KA4ZAY
Jacksonville	FL	52. 300	53. 030	N4UF
Eustis	FL	52. 050	53. 050	N4AQL
Pensacola	FL	52. 050	53. 050	WA4URF
New Port Richey	FL	52. 070	53. 070	WA4AGX
North Lauderdale	FL	52. 090	53. 090	WA1JOU
Miami	FL	52. 110	53. 110	KI4CA
Plant City	FL	52. 130	53. 130	W4JVG
Miami	FL	52. 170	53. 170	KB4ES
Tampa	FL	52. 290	53. 290	WB4UIB
Tampa	FL	52. 450	53. 450	WA4HRF
Largo	FL	52. 550	53. 550	WA4GCH
Miami	FL	52. 650	53. 650	WB4PHR
Shell Point	FL	52. 670	53. 670	WA4ISJ
Fort Lauderdale	FL	52. 730	53. 730	WB4MNE

CITY.....	STATE. CODE	INPUT..	OUTPUT.	R. CALL
Marietta	GA	52. 050	53. 050	WB4UPC
Rockford	IL	52. 010	53. 010	K9AMJ
Indianapolis	IN	53. 480	52. 480	WA9IQW
Terre Haute	IN	52. 920	52. 525	W9EGD
Indianapolis	IN	53. 160	52. 560	WB9IHS
Evansville	IN	52. 920	52. 575	W9ZPP
Auburn	IN	52. 840	52. 600	WB9VDK
Indianapolis	IN	52. 840	52. 600	WB9GLJ
Indianapolis	IN	53. 200	52. 600	WB9GLJ
Angola	IN	52. 920	52. 600	WB9FHD
Angola	IN	52. 920	52. 600	WB9AEI
Indianapolis	IN	52. 600	52. 840	WB9GLU
South Bend	IN	52. 760	53. 360	WR9AFV
Topeka	KS	52. 010	53. 010	KA0LIA
Baton Rouge	LA	52. 760	52. 525	W5RWF
Fairbanks	LA	52. 010	53. 010	K5CHA
Chalmette	LA	52. 025	53. 025	WA5UUD
Chalmette	LA	52. 050	53. 050	WD5KBB
New Orleans	LA	52. 130	53. 130	WB5ZRL
Billerica	MA	52. 620	52. 620	W1DC
Maynard	MA	52. 660	52. 660	WA1NPN
Pepperell	MA	52. 110	53. 110	WA1VVH
Worcester	MA	52. 120	53. 120	WA1RJC
Adams/Mt. Greylock	MA	52. 230	53. 230	K1FFK
Waltham	MA	52. 270	53. 270	K1MUC
Mt. Wachusett	MA	52. 010	53. 440	WA1UPP
Winnipeg	MB	52. 760	52. 525	VE4AQA
Winnipeg	MB	52. 500	52. 760	VE4AQA
Mt Baltimore	MD	52. 150	53. 150	WA3DZZ
Wheaton	MD	52. 250	53. 250	WB3DBU
Wheaton	MD	144. 950	53. 250	WB3DBU
Wheaton	MD	52. 250	144. 950	WB3DBU
Streaked Mt.	ME	53. 570	52. 570	WB1AEK
West Bloomfield	MI	52. 520	52. 600	WBHD
Twp.				
Lansing	MI	52. 030	53. 030	WB4VVA
Ann Arbor	MI	52. 050	53. 050	WBBUPM
Manistique	MI	52. 600	53. 600	KABKYR
Edina	MN	52. 760	52. 525	WBPZT
Bloomington	MN	52. 030	53. 030	N0BID
Minnetonka	MN	52. 050	53. 050	W0TQL
Proctor	MN	52. 050	53. 050	N0BZZ
Oak Lake	MN	52. 250	53. 250	WD0HWT
St. Paul	MN	52. 470	53. 470	KA0JLB
Overland	MO	52. 250	52. 800	K0RWU
Branson	MO	52. 250	52. 800	WA0LKT
St. Louis	MO	52. 050	52. 950	K0CFM
Hattiesburg	MS	52. 010	53. 010	K05K
Hendersonville	NC	52. 010	53. 010	WB4YAD
Charlotte	NC	52. 030	53. 030	KE4ZC
Roanoke Rapids	NC	52. 030	53. 030	K4PUV
Raleigh	NC	52. 050	53. 050	K4ITL
High Point	NC	52. 150	53. 150	K4AIA
Cary	NC	52. 350	53. 350	WR4AVP
Hickory	NC	52. 470	53. 470	WA4MDH

CITY.....	STATE. CODE	INPUT..	OUTPUT.	R. CALL
Statesville	NC	52. 670	53. 670	WA4WRS
#Concord	NH	52. 010	53. 010	N1DSV
Brentwood	NH	53. 040	53. 640	WA1HZK
High Point	NJ	440. 025	52. 525	K2KGZ
Waterford Works	NJ	52. 840	52. 680	W2FLY
Trenton	NJ	52. 900	52. 700	W2ZG
North Arlington	NJ	52. 010	53. 010	WA2S00
Bayonne	NJ	52. 090	53. 090	W2K9
Mt. Freedom	NJ	52. 150	53. 150	KC2CY
Midland Park	NJ	52. 210	53. 210	WA2VLD
North Caldwell	NJ	52. 310	53. 310	WB2ZRK
Woodcliff Lake	NJ	52. 330	53. 330	K2LSA
Hackensack	NJ	52. 350	53. 350	WB2ZNP
Cliffwood Beach	NJ	52. 430	53. 430	WB2HAE
Tabernacle Twp.	NJ	52. 450	53. 450	WB2YZS
High Point	NJ	52. 510	53. 510	K2KGZ
High Point	NJ	440. 025	53. 510	K2KGZ
High Point	NJ	52. 525	53. 510	K2KGZ
Mt. Holly	NJ	52. 550	53. 555	K2QIJ
Haledon	NJ	52. 630	53. 630	WA2OFI
North Bergen	NJ	52. 670	53. 670	WA2SLR
Cold Springs	NV	52. 150	52. 750	N7CMJ
Schenectady	NY	52. 760	52. 560	K2AE
Babylon	NY	52. 900	52. 680	WA2CDH
Otisco	NY	52. 010	53. 010	WB2ZHL
Corinth	NY	52. 010	53. 010	WA2UMX
Schenectady	NY	52. 030	53. 030	K2AE
Colden	NY	52. 050	53. 050	WR2ABI
Auburn	NY	52. 050	53. 050	WB2MLB
Rochester	NY	52. 070	53. 070	WB9EAE
Wilson	NY	52. 150	53. 150	W2XE
Bedford	NY	52. 170	53. 170	WB2HMC
Hamburg	NY	52. 250	53. 250	WB2FCS
Chatham	NY	52. 470	53. 470	WA2PVV
Manhattan	NY	52. 470	53. 470	K2KLN
Rochester	NY	52. 550	53. 550	N2EH
Syracuse	NY	52. 550	53. 550	AE2K
Mayville	NY	52. 570	53. 570	WA2EGX
Rochester	NY	52. 570	53. 570	WA2DHB
Setauket	NY	52. 580	53. 580	K2YBW
Setauket	NY	52. 525	53. 580	K2YBW
Rochester	NY	52. 630	53. 630	W2TR
Harpursville	NY	52. 750	53. 750	WA2IKO
Manhattan	NY	52. 470	145. 450	K2KLN
Manorville	NY	52. 360	146. 020	W20GI
Setauket	NY	52. 940	146. 940	K2TKE
Manhattan	NY	52. 470	224. 700	K2KLN
Glendale	NY	52. 525	224. 740	WA2NCB
Manhattan	NY	52. 470	443. 950	K2KLN
Warrensville Twp.	OH	52. 920	52. 600	WBBAFD
North Canton	OH	52. 010	53. 010	WD4HAL
Fairfield	OH	52. 170	53. 170	WD8PRH
Bellefontaine	OH	52. 250	53. 250	KA2OFZ
Vermilion	OH	52. 350	53. 350	WD8DRI
Fredonia	OH	52. 430	53. 430	WA8WCU

CITY.....	STATE. CODE	INPUT..	OUTPUT.	R. CALL
Mansfield	OH	52. 470	53. 470	WDBNDB
Louisville	OH	52. 550	53. 550	WB8UTW
Athens	OH	52. 730	53. 730	WBWQ
Oklahoma City	OK	52. 680	52. 525	K5JL
Lucan	ON	52. 010	53. 010	VE3MCR
Toronto	ON	52. 030	53. 030	VE3SIX
Orillia	ON	52. 070	53. 070	VE3LSR
Georgetown	ON	52. 130	53. 130	VE3IZU
Ottawa	ON	52. 525	53. 150	VE3OCR
London	ON	52. 470	53. 470	VE3MOI
Roseburg	OR	52. 030	53. 030	WA7SRX
Eugene	OR	52. 050	53. 050	K9CNV
Warminster	PA	53. 040	52. 040	K3NAL
Aston	PA	52. 620	52. 380	W3AWA
Roxborough	PA	52. 760	52. 640	K3VAN
Transfer	PA	52. 010	53. 010	K3QMR
DuBois	PA	52. 070	53. 070	K3PS
Scranton	PA	52. 370	53. 370	K933Y
Wilkes-Barre	PA	52. 610	53. 610	WB3FXQ
Wilkes-Barre	PA	52. 810	53. 810	WA3YXK
Roxborough	PA	52. 760	443. 600	K3VAN
Ottawa, ON	PQ	52. 525	53. 150	VE3OCR
Parc des	PQ	53. 135	53. 635	VE2RAH
Laurentides				
Pickens	SC	52. 410	53. 410	WB4YXZ
Knoxville	TN	52. 760	52. 525	K4HXD
Nashville	TN	52. 760	52. 525	W4PGP
Chattanooga	TN	52. 010	53. 010	WB4LRD
Memphis	TN	52. 010	53. 010	WA4KDG
Knoxville	TN	52. 150	53. 150	WB4IOB
Knoxville	TN	52. 250	53. 250	WA4YON
Knoxville	TN	52. 350	53. 350	WB4CBI
College Station	TX	52. 760	52. 525	K5HW
Henly	TX	52. 800	52. 525	W5IZN
Dallas	TX	52. 760	52. 525	WA5SNW
El Paso	TX	52. 920	52. 525	K85JR
Corpus Christi	TX	53. 160	52. 560	WD5DON
Fort Worth	TX	53. 160	52. 560	K3SXX
San Antonio	TX	53. 180	52. 580	WA5KAG
Temple	TX	52. 620	52. 580	NU5D
Tyler	TX	53. 180	52. 580	WA5SPB
Port Neches/Groves	TX	53. 640	52. 640	WB5ITT
San Antonio	TX	52. 880	52. 640	WR5ADH
Fort Worth	TX	53. 280	52. 680	WB5ATB
Austin	TX	52. 840	52. 720	WA5JGV
Fort Worth	TX	53. 325	52. 725	K5CDR
San Antonio	TX	53. 640	53. 040	WB5ICH
El Paso	TX	52. 090	53. 090	K05EJ
Conroe	TX	52. 130	53. 130	W5SUR
San Antonio	TX	52. 130	53. 130	W5VPG
Allen	TX	52. 230	53. 230	WB5UST
Arlington	TX	52. 250	53. 250	WB5XGL
Greenville	TX	52. 470	53. 470	
Austin	TX	52. 670	53. 670	WB5PCV
Fort Worth	TX	52. 990	53. 990	KA5BYN

CITY.....	STATE. CODE	INPUT..	OUTPUT.	R. CALL
#Fairfax	VA	52.648	52.448	WD4KHP
#Fairfax	VA	52.648	52.448	WD4KHP
#Fairfax	VA	52.588	52.488	KA4DCS
	VA	52.588	52.488	
Norfolk	VA	53.525	52.525	W4NV
Lexington/Cole Mt.	VA	52.818	53.818	K4PQD
Norton/High Knob	VA	52.818	53.818	K4LSP
South Boston	VA	52.878	53.878	WB4YWH
Alexandria	VA	52.138	53.138	WA4CCF
Danville	VA	52.138	53.138	WB4GJG
Lynchburg	VA	52.158	53.158	WB4D8B
Richmond	VA	52.438	53.438	NB4B
Alexandria	VA	52.138	224.628	WA4CCF
Alexandria	VA	52.138	224.628	WA4CCF
Olympia	WA	52.838	53.838	K7RBR
Snohomish	WA	52.878	53.878	KB7C
Mt. Vernon	WA	52.898	53.898	K7CR
Tacoma	WA	52.158	53.158	K7CR
Seattle	WA	52.298	53.298	W7FHZ
Spokane	WA	52.298	53.298	K7LV8
Seattle	WA	52.378	53.378	K7LED
Kirkland	WA	52.558	53.558	KC7RD
Bothell	WA	52.638	53.638	WA7RYG
Everett	WA	52.938	53.938	K7KHH
Dconomoc	WI	53.158	52.158	WR9ALK
Milwaukee	WI	52.888	52.288	WB9YRD
Milwaukee	WI	52.888	52.585	WB9WHR
Milwaukee	WI	52.888	52.688	WB9ZRB
Waukesha	WI	53.548	52.948	K9WGG
New Berlin	WI	52.858	53.858	WR9ABF
New Berlin	WI	52.858	53.858	WA9ADL
Wind Lake	WI	52.338	53.338	N9DIR
St. Mary's/Ben's Run	WV	52.178	53.178	WDBRET

258 items listed.

CERTIFICATE OF SERVICE

I, Francine J. McCullion, Office Manager of the law firm of Booth, Freret & Imlay, do hereby certify on this 2nd day of January, 1986, that I have caused a copy of the foregoing COMMENTS OF THE AMERICAN RADIO RELAY LEAGUE, INCORPORATED to be mailed, via first class U.S. mail, postage prepaid, to the offices of the following:

Donald L. Stoner, W6TNS
6014 E. Mercer Way
Mercer Island, WA 98040

Francine J. McCullion
Francine J. McCullion

January 6, 1985

RADIO AMATEUR TELECOMMUNICATIONS SOCIETY
206 North Vivian Street
Berserfield, NJ 07621

Prepared by: Thomas A. Moulton, W2VY

28 January 1986

Command	Default	Description
Shilconv	OFF	Strip high-order bit when in convers mode
AUtoLf	ON	Send Linefeed to terminal after each CR
AWlen	7	Terminal character length (7/8)
Ax2512v2	OFF	Run as version 1.0 of AX.25
AXDelay	0	(0-180 * 0.1 sec) Voice Repeater delay
AXHans	0	(0-20 * 0.1 sec) Voice Repeater hang time
Every	E 0	Every/After 0-250 * 10 sec.
BKondel	1	Send BS SP BS for each DELETE character
BText		(120 char) Text to be sent for a beacon
BUDlist	OFF	Stations in Lcalls are ignored
CALibra		Used to calibrate the builtin modem
CALSet		Used with CALibrate
CANline	\$18	(Control-X) The Line Delete character
CANPac	\$19	(Ctrl-Y) Cancel current character
CHech	30	(0-250 * 10 sec) Idle link time out
CLKADJ	0	(0-65535) Real time clock adjustment constant
CMDtime	1	(0-255 sec) transparent mode escape timer
CMSG	OFF	Don't send CTEXT when user links to your TNC
CONmand	\$03	Char to escape from CONVERS mode to command mode
CONMode	CONVERS	(or TRANS) Mode to enter when link established
Connect		Establish Link with station via optional stations
CONOP	ON	Allow stations to establish a link with your TNC
CONPerm	OFF	If ON always keep this link up (never Disconnect)
CONStamp	OFF	If ON print date & time stamp on connect messages
CStatus		Prints the status of all links (Streams)
CONVers		Enter Converse mode from command mode
CPectime	OFF	Don't forward data based on timer (see Pactime)
CR	ON	Append a Carriage Return to each data packet
CText		(120 Ch) Connect Message Text (see CMSG)
Daytime		Date and time for real time clock
DATUse	ON	Print date as mm/dd/yy instead of dd-mm-yy
DELeTe	OFF	The character delete is BS (\$08) not DEL (\$7F)
DIGipeet	ON	Allow stations to use you as a Disipeater
Disconne		Request a link disconnect from the other station
Display		(Assoc/Character/Id/Monitor/Timings) Parameters
DWait	16	(0-250 * 10 msec) Delay to let disipeater reset
Echo	ON	Echo characters typed on keyboard to terminal
EScape	OFF	Don't translate ESC character (\$1B) to \$ (\$24)
Flow	ON	Don't print to terminal while user is typing
FRack	3	(1-15 sec) Time needed to ack a packet per station
FULLdup	OFF	Operate in Simplex mode
HEaderIn	OFF	Print the frame header and text on the same line
HID	OFF	Don't send an ID packet every 5 mins when active
ID		Force an ID packet (UI frame Via UNiproto path)
LCALLS		(0-8 calls) to receive or ignore stations (BUDLIST)
LOCK	ON	Do not convert lower case to UPPER CASE on terminal

RADIO AMATEUR TELECOMMUNICATIONS SOCIETY

Prepared by: Thomas A. Moulton, W2VY

28 January 1986

Command	Default	Description
LCSTREAM	ON	Convert the stream select specifier to Upper case
LFadd	OFF	Add a Line Feed after each CR send to the terminal
MAll	ON	Monitor data frames as well as beacons
MAXframe	4	The window size for outstanding frames
MCOM	OFF	Monitor only data frames instead of all types
MCon	OFF	Don't monitor frames when linked to another station
MFilter		Up to 4 characters to be removed from monitored data
MHClear		Clear the calls Heard list
MHeard		Display the calls heard and date/time if clock set
Monitor	ON	Monitor mode on - see BUDLIST, MALL, MCON, MESTAMP
MRpt	ON	Display the digipeater path in monitored frames
MStamp	OFF	Monitored frames are Not time stamped
MYAlias		An identifier for a digipeater
MYcall	NOCALL	The station callsign for ID and linking
NEwmode	OFF	The TNC acts like a TNC 1 for changing modes
NOmode	OFF	If ON allow explicit mode change only
NUcr	OFF	Don't send NULLS (\$00) after a CR
NULf	OFF	Don't send Nulls after a LF
NULLS	0	(0-30) Number of nulls to send as requested
Paclen	128	(0-255,0=256) size of the data field in a data frame
PACTime	After 10	(Every/After 0-250 *100 ms) Data forwarding timer
PARity	3 (even)	(0-3) Terminal parity 0,2=None 1=odd 3=even
PASs	\$16	(CTRL-V) char to allow any character to be typed
PASSall	OFF	Accept only frames with valid CRCs
REConnect		Like Connect but to reestablish a link via a new path
REDisplay	\$12	(CTRL-R) char to print the current input buffer
RESET		RESET bBRAM PARAMETERS TO DEFAULTS
RESetime	12	(0-250 * 100 ms) minimum delay for sending an ACK
RESTART		Perform a power on reset
RETry	10	(0-15) maximum number of retries for a frame
ScreenLn	80	(0-255) Terminal output width
SEndpac	\$0D	(CR) Char to force a frame to be sent
STArt	\$11	(CTRL-Q) the XON for data TO the terminal
STOp	\$13	(CTRL-S) the XOFF for data TO the terminal
STREAMCa	OFF	Don't show the callsign after stream id
STREAMDb1	OFF	Don't print the stream switch char twice (!!A)
STReamsw	\$7C (!)	Character to use to change streams (links)
TRAcE	OFF	Hexidecimal trace mode is disabled
TRANS		The TNC enters Transparent data mode
TRFlow	OFF	Disable flow control to the Terminal (Trans mode)
TRies		(0-15) set or display the current retry counter
TXdelay	30	(0-120 * 10ms) Keyup delay for the transmitter
TXFlow	OFF	Disable flow control to the TNC (Transparent mode)
Uneroto	CG	Path and address to send beacon data
USers	1	Sets the number of streams (links) allowed
Xflow	ON	XON/XOFF Flow control enabled instead of hardware
XMitok	ON	Allow transmitter to come on
XOff	\$13	(CTRL-S) Character to stop data from terminal
XON	\$11	(CTRL-Q) Character to start data from terminal

amateur radio NEWS

The American Radio Relay League, Inc.

Newington, Connecticut 06111

For more information contact:

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FOR IMMEDIATE RELEASE

January 9, 1986

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ARRL DIGITAL COMMITTEE MEETING

1. Review of 85-105

2. Mitigating Congestion

3. Level 3

4. Jack Sanders Protocol

5. Meeting in Summer

6. International aspect of Packet Radio IARU

7. DNIC Number Request

8. Petition of FCC 30 MHz below

9.

⑥ International aspects of PR
Situation in UK
Stimulus in Europe a PR meeting

⑦ DNIC Code

⑧ Auto control below 30 MHz
Loss of HF network

① Petition FCC for automatic control
Petition granted with reminder
Third party stipulations
Petition for reconsideration
Specific: 50 MHz, Packet, AX.25
Specific definition not needed for 3rd.

Third Party Switch
Receive only 803

Classification of 3rd party How to them

② FRED
Higher Speed
Design for high speed modems
New ARRL motion in favor: 3 committees → None freq for packet
Send freq use requests to ARRL

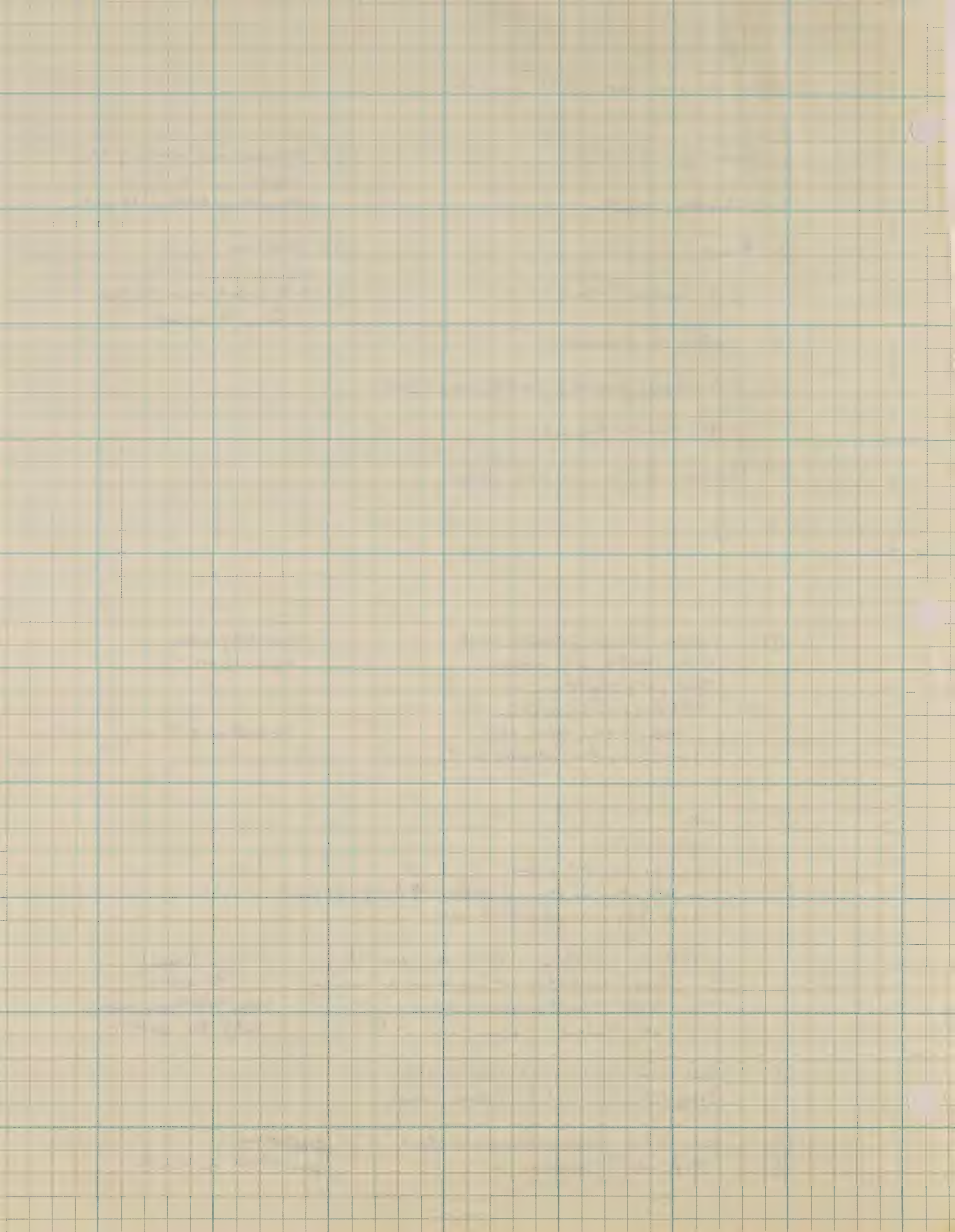
Modems: critical, don't stop experimenting
9600 - worthwhile but not answer to intercity
56 Kbps - most productive area
9600 Voiceband - please, more tests

Tom Kneisel
K4 GFG
Tested 9600 audio modems
Tested 56K for FADCA

③ Phil Karn - Level 3 code available
Terry Fox - Level 3 Virtual Circuit

④ Jack Sanders message transfer protocol
⑤ Next network conference in S. Cal.

~~June 14-16~~
June 14-16 in Newington





THE AMERICAN RADIO RELAY LEAGUE, INC.

INTERNATIONAL SECRETARIAT OF THE INTERNATIONAL AMATEUR RADIO UNION

ADMINISTRATIVE HEADQUARTERS NEWINGTON, CONNECTICUT, U. S. A. 06111

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203-666-1541

QST

OFFICIAL JOURNAL

January 27, 1986

To : Ad Hoc Committee on Amateur Radio Digital Communication
From : Chairman
Subject: Board Meeting and What's Ahead

1. The ARRL Board of Directors held its annual meeting in Hartford on January 23 and 24. I'll report on items of particular interest to the Committee and send you copies of the Minutes as soon as official copies are available.

2. First, let me bring you up-to-date on Committee members...

a. President Larry Price, W4RA, appointed Tod Olson, K0TO, as Board Liaison. Tod was Dakota Division Director and is the newly elected International Affairs Vice President. He comes with impressive credentials: He's active on packet and is in the disk-drive manufacturing business. Larry made a point of telling me that he sees the International Affairs Vice President as a link between the Committee, IARU and Sister Societies. You can also see the connection by noting that the Region 3 IARU conference "adopted the AX.25 protocol as an interim standard for packet radio and asked ARRL, through their Ad Hoc Committee on Amateur Radio Digital Communication, to act as the coordinating body, subject to the requirements of radio amateurs as expressed through IARU," to quote from Dick Baldwin's article in March 1986 QST. I haven't had a chance to explore the implications of this with Tod, but I'm sure he can fill us in when we meet.

b. Marshall Quiat, AG0X, remains with us as Alternate. He is planning to be at Orlando.

c. In addition, President Price also signed letters appointing Harold Price (no relation), NK6K, and Phil Karn, KA9Q, to the Digital Committee. Congratulations to you both!

d. A complete list of Digital Committee members is enclosed. Please review this list for correctness and completeness. In view of the international interest, please let me have your recommendations as to who in IARU or Sister Societies should regularly receive our mailings.

3. The Board unanimously voted "that the president take such actions as may be necessary and appropriate to cause FCC Docket 85-105 to be amended to correct its restrictive and crippling effect on the development of packet radio and packet radio emergency communications caused by requirements for the control operator to be present at domestic intermediary relay points for transmission of third party traffic."

a. The full text of FCC Docket 85-105 is enclosed. It is likely that the League will make a formal request for reconsideration within 30 days of the Report and Order's appearance in the Federal Register. In addition, President Larry Price and Washington Area Coordinator Perry Williams are expected to pay a visit on the FCC. Washington, DC packeteers should stand by for a possible request from Perry Williams for a live packet-radio demonstration.

b. Don't pass this where it might possibly appear in print because it contains opinion that is subject to change: Perry Williams has discussed Docket 85-105 with FCC Private Radio Bureau Special Services Division Chief Ray Kowalski. Ray reportedly indicated willingness to say that amateur-to-amateur traffic is not "third party," but no current willingness to budge on the need for the presence of a control operator whenever third-party traffic is being transmitted over either a digipeater or a voice repeater.

c. I'll keep you posted on Docket 85-105 by mail and be able to fill you in when we meet in Orlando.

4. The Board also authorized a Blue Ribbon committee to study the National Traffic System and handling of traffic in emergencies. Vice Director Thomas W. Comstock, N5TC, was named Chairman of this committee. It is reasonable to expect packet radio to play a vital role in modernizing NTS. Please let me have your thoughts; I'll consolidate and pass them to Tom.

5. Several committees, including ours, were tasked with studying HF and VHF packet-radio frequencies with a view toward making more channels available to alleviate congestion. That might strike you as excessively bureaucratic, but if packet is a "gainer," someone else has to be a "loser." The other committees will be helpful in weighing packet needs against others and running interference when the frequencies are identified. Meanwhile, it behooves us to develop our requirements.

6. The Board budgeted \$14,000 in 1986 for the Digital Committee. That is more than a comfortable amount for two in-person meetings and just enough for three.

a. The first meeting of the year will be in Orlando at 3 PM, on March 8, as previously announced. (Please make advance airline bookings to minimize cost.)

b. My agenda items will include:

- (1) Congestion mitigation (including HF/VHF frequency requirements)
- (2) Networking/transport protocols (including any live demos of VC and DG networking)
- (3) FCC Docket 85-105
- (4) Your evaluation of, and comments on, the radiogram-transfer protocol proposed by Jack Sanders, NC4E, entitled "American National Standard for Electronic Business Data Interchange Amateur Radio Message Transaction Set." (Obviously that name has to be changed!)
- (5) Planning of subsequent meetings and the Sixth ARRL Amateur Radio Computer Networking Conference. (Invitations will be considered.)
- (6) Dealings with the IARU and Sister Societies on packet radio

c. Please let me have your agenda items as soon as possible.

7. A copy of the Committee's report to the Board is enclosed, for your information.

73,



Paul L. Rinaldo, W4RI

encl. Digital Committee List
FCC Docket 85-105
Digital Committee Report (Doc. #24)

AD HOC COMMITTEE ON AMATEUR
RADIO DIGITAL COMMUNICATION

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Masa

amateur radio **NEWS**

The American Radio Relay League, Inc.

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Amateur Radio Internet Programmer's Guide

This article documents the various modules making up the KA9Q Amateur Radio Internet Protocol Package. The following protocols are currently supported:

1. Internet Protocol (IP) - the universal network-level datagram protocol of the ARPA Internet. It corresponds roughly to level 3 of the ISO Reference Model (ISORM, or the 3B internetwork sublayer if you follow the amoeboid proliferation of ISO sublayers). Routines are provided to generate, receive and route (i.e., packet switch) IP datagrams. IP is specified in ARPA RFC-791 and MIL-STD-1777.
2. Internet Control Message Protocol (ICMP) - the error reporting adjunct to IP. It appears as a pseudo-protocol on top of IP, but is actually considered to be part of IP. The IP routines automatically generate ICMP messages whenever an error occurs in the processing of IP datagrams; incoming ICMP messages are passed up to the originating end-to-end protocol for appropriate action. ICMP is specified in ARPA RFC-792.
3. Transmission Control Protocol (TCP) - provides a reliable, sequenced "virtual circuit" or "connection-oriented" service atop IP on an end-to-end basis. It corresponds to the Transport layer (level 4) of the OSI model. Since a single TCP module supports multiple connections through the use of port numbers, it also provides Session (level 5) functionality without the need for a distinct layer. (Or it makes the session layer unnecessary, depending on your point of view). TCP is specified in ARPA RFC-793 and MIL-STD-1778.
4. User Datagram Protocol (UDP) - provides a simple, unguaranteed "datagram" or "connectionless" service, adding only checksums and port multiplexing to the raw service provided by IP. As an alternative to TCP, UDP also sits at level 4 (and 5) of the ISORM. UDP is specified in ARPA RFC-768.

The implementation is highly modular. For example, if one wants to build a dedicated packet switch without any local applications, the TCP and UDP modules may easily be omitted to save space.

Data Structures

To increase portability, the pseudo-types "int16" and "int32" are used to mean an unsigned 16-bit integer and a signed 32-bit integer, respectively. Ordinarily these types are defined in machdep.h to be "unsigned int" and "long".

The various modules pass data in chained structures called mbufs, with the following format:

```
struct mbuf {
    struct mbuf *next; /* Links mbufs belonging to single packets */
    struct mbuf *anext; /* Links packets on queues */
    char *_buf; /* Allocated data buffer, if any */
    char *data; /* Pointer to start of actual data in buffer */
    int16 cnt; /* Length of data in buffer */
};
```

Although somewhat cumbersome to work with, mbufs make it possible to avoid memory-to-memory copies that limit performance. For example, when user data is transmitted it must first traverse several protocol layers before reaching the transmitter hardware. With mbufs, each layer prepends its protocol header by allocating an mbuf and linking it to the head of the mbuf "chain" given it by the higher layer, thus avoiding several copy

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operations.

A number of primitives operating on mbufs are available in mbuf.c. The user may create, fill, empty and free mbufs himself with the alloc_mbuf and free_mbuf primitives, or at the cost of a single memory-to-memory copy he may use the more convenient wdata() and ddata() primitives.

Timer Services

TCP and IP require timers. A timer package is included, so the user must arrange to call the single entry point "tick" on a regular basis. The constant MSPTICK in timer.h should be defined as the interval between ticks in milliseconds. One second resolution is adequate. Since it can trigger a considerable amount of activity, including wpcalls to user level, "tick" should not be called from an interrupt handler.

Internet Type-of-Service

One of the features of the Internet is the ability to specify precedence (i.e., priority) on a per-datasram basis. There are 8 levels of precedence, with the bottom 6 defined by the DoD as Routine, Priority, Immediate, Flash, Flash Override and CRITICAL. (Two more are available for internal network functions). For amateur use we can use the lower four as Routine, Welfare, Priority and Emergency. Three more bits specify class of service, indicating that especially high reliability, high throughput or low delay is needed for this connection. Constants for this field are defined in internet.h.

The Internet Protocol Implementation

While the user does not ordinarily see this level directly, it is described here for sake of completeness. Readers interested only in the interfaces seen by the applications programmer should skip to the TCP and UDP sections.

The IP implementation consists of three major functions: ip_route, ip_send and ip_recv.

IP Gateway (Packet Router) Support

The first, ip_route, is the IP packet switch. It takes a single argument, a pointer to the mbuf containing the IP datasram:

```
void
ip_route(bp)
struct mbuf *bp; /* Datasram pointer */
```

All IP datasrams, coming or going, pass through this function. The datasram's destination address is extracted and an internal routing table consulted to determine where the datasram should be handled. The routing table is a fast hash table keyed on IP destination addresses, called "targets". If the target address is not found, a special "default" entry, if available, is used. If a default entry is not available either, an ICMP "Destination Unreachable" message containing the offending IP header is returned to the sender.

Entries are added to the IP routing table with the rt_add function:

```
int
rt_add(target,gateway,metric,send,device)
int32 target; /* IP address of target */
int32 gateway; /* IP address of neighbor gateway to reach this target */
int metric; /* "cost" measurement, available for routing decisions */
```


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```
void (*send)(); /* Function address to be called with packets */
int device; /* Sub device number to be passed to send routine */
```

"target" is the IP address of the destination; it becomes the hash index key compared to subsequent packet destination addresses. If target == 0, the default entry is modified. "metric" is simply stored in the table; it is available for routing cost calculations when an automatic routing protocol is written. "send" is the address of a function that should be called whenever the destination address in a datagram matches this target. It is called as follows:

```
(*send)(bf,device,gateway)
struct mbuf *bf; /* Pointer to datagram */
int device; /* Hardware "device" number to be used */
int32 gateway; /* IP address of gateway */
```

The "device" and "gateway" arguments specified to rt_add are stored in the routing table and passed on each call to the send routine. "device" is used to distinguish between one of several identical devices (e.g., serial links or radio channels) that might share the same send routine. If there is only one device, the send routine may ignore the device number. "gateway" is the IP address of the neighboring IP gateway on the other end of the link; if a link-level address is required, the send routine must map this address either dynamically (e.g., with the Address Resolution Protocol, ARP) or with a static lookup table. If the link is point-to-point, link-level addresses are unnecessary, and the send routine can therefore ignore the gateway address.

The send routine should sort its queue of datagrams pending transmission by the IP precedence field. If a datagram is queued with a precedence that "greatly" exceeds the one currently being transmitted, the send routine may decide to abort the one already in progress in favor of the more urgent traffic.

If the datagram is larger than the maximum packet size allowed by the lower level driver, the send routine is responsible for fragmenting the datagram appropriately.

rt_add returns 0 on success, -1 on failure (e.g., out of memory).

To remove an entry from the routing table, only the target address need be specified to the rt_drop call:

```
int
rt_drop(target)
int32 target;
```

rt_drop returns 0 on success, -1 if the target could not be found.

IP Host Support

A special routine takes the place of a "send" routine for datagrams addressed to ourselves. This function, passed in a rt_add call specifying our IP address, is ip_recv:

```
void
ip_recv(bf,dev,gateway)
struct mbuf *bf;
int16 dev; /* Ignored */
int32 gateway; /* Ignored */
```

ip_recv reassembles IP datagram fragments, if necessary, and calls the input

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function of the next layer protocol (e.g., tcp_input, udp_input) with the appropriate arguments, as follows:

```
(*protrecv)(bp,protocol,source,dest,tos,length);
struct mbuf *bp;          /* Pointer to packet minus IP header */
char protocol;            /* IP protocol ID */
int32 source;             /* IP address of sender */
int32 dest;               /* IP address of destination (i.e., us) */
char tos;                 /* IP type-of-service field in datagram */
int16 length;             /* Length of datagram minus IP header */
```

The list of protocols is contained in a switch() statement in the ip_recv function. If the protocol is unsupported, an ICMP Protocol Unreachable message is returned to the sender.

Higher level protocols such as TCP and UDP use the ip_send routine to generate IP datagrams. The arguments to ip_send correspond directly to fields in the IP header, which is generated and prepended to the user's data before being handed to ip_route:

```
ip_send(source,dest,protocol,tos,ttl,bp,length,id,df)
int32 source;             /* source address */
int32 dest;               /* Destination address */
char protocol;           /* Protocol */
char tos;                 /* Type of service */
char ttl;                 /* Time-to-live */
struct mbuf *bp;          /* Data portion of datagram */
int16 length;             /* Optional length of data portion */
int16 id;                 /* Optional identification */
char df;                  /* Don't-fragment flag */
```

This interface is modeled very closely after the example given on page 32 of RFC-791. Zeros may be passed for id or ttl, and system defaults will be provided. If zero is passed for length, it will be calculated automatically.

The Transmission Control Protocol (TCP)

A TCP connection is uniquely identified by the concatenation of local and remote "sockets". In turn, a socket consists of a host address (a 32-bit integer) and a TCP port (a 16-bit integer), defined here by the C structure

```
struct socket {
    long address;          /* 32-bit IP address */
    short port;            /* 16-bit TCP port */
};
```

It is therefore possible to have several simultaneous but distinct connections to the same port on a given machine, as long as the remote sockets are distinct. Port numbers are assigned either through mutual agreement, or more commonly when a "standard" service is involved, as a "well known port" number. For example, to obtain standard remote login service using the TELNET presentation-layer protocol, by convention one initiates a connection to TCP port 23; to send mail using the Simple Mail Transfer Protocol (SMTP) one connects to port 25. ARPA maintains port number lists and periodically publishes them; the latest revision is RFC-960, "Assigned Numbers". They will also assign port numbers to a new application on request if it appears to be of general interest.

TCP connections are best modeled as a pair of one-way paths (one in each direction) rather than as a single full-duplex path. Station A may close its path to station B leaving the reverse path from B to A unaffected. B

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may continue to send data to A indefinitely until it too closes its half of the connection. This is known as "graceful close" and can greatly simplify an application.

TCP Module Overview

This package is written as a "module" intended to be compiled and linked with the application(s) so that they can be run as one program on the same machine. This greatly simplifies the user/TCP interface, which becomes just a set of internal subroutine calls on a single machine. The internal TCP state (e.g., the address of the remote station) is easily accessed. Reliability is improved, since any hardware failure that kills TCP will likely take its applications with it anyway. Only IP datagrams flow out of the machine across hardware interfaces (such as asynch RS-232 ports or whatever else is available) so hardware flow control or complicated host/front-end protocols are unnecessary.

The TCP supports five basic operations on a connection: `open_tcp`, `send_tcp`, `receive_tcp`, `close_tcp` and `delete_tcp`. A sixth, `state_tcp`, is provided mainly for debugging. Since this TCP module cannot assume the presence of a sleep/wakeup facility from the underlying operating system, functions that would ordinarily block (e.g., `recv_tcp` when no data is available) instead set `net_error` to the constant `EWOULDBLK` and immediately return -1. Asynchronous notification of events such as data arrival can be obtained through the `ucall` facility described earlier.

Each TCP function is summarized in the following section in the form of C declarations and descriptions of each argument.

```
int net_error;
```

This global variable stores the specific cause of an error from one of the TCP or UDP functions. All functions returning integers (i.e., all except `open_tcp`) return -1 in the event of an error, and `net_error` should be examined to determine the cause. The possible errors are defined as constants in the header file `netuser.h`.

```
/* Open a TCP connection */
```

```
struct tcb *
open_tcp(lsocket,fsocket,active>window,r_ucall,t_ucall,s_ucall,tos)
struct socket *lsocket; /* Local socket */
struct socket *fsocket; /* Remote socket */
int active;             /* Active/passive */
int16 window;          /* Receive window (and send buffer) sizes */
void (*r_ucall)();      /* Function to call when data arrives */
void (*t_ucall)();      /* Function to call when ok to send more data */
void (*s_ucall)();      /* Function to call when connection state changes */
char tos;               /* Internet Type-of-Service */
```

"lsocket" and "fsocket" are pointers to the local and foreign sockets, respectively.

"active" is 0 for a "passive" open (one in the TCP LISTEN state). A passive open does not cause any packets to be sent, but enables TCP to accept a subsequent active open from another TCP. If a specific foreign socket is passed to a passive open, then connect requests from any other foreign socket will be rejected. If the foreign socket fields are set to zero, or if NULL is passed as fsocket, then connect requests from any foreign socket will be accepted. If "active" is 1, TCP will initiate a connection to a remote socket that must already have been created in the LISTEN state by its client. The foreign socket must be completely

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specified in an active open.

"r_upcall", "t_upcall" and "s_upcall" provide optional upcall or pseudo-interrupt mechanisms useful when running in a non operating system environment. Each of the three arguments, if non-NULL, is taken as the address of a user-supplied function to call when receive data arrives, transmit queue space becomes available, or the connection state changes. The three functions are called with the following arguments:

```
(*r_upcall)(tcb,count); /* count == number of bytes in receive queue */
(*t_upcall)(tcb,avail); /* avail == space available in send queue */
(*s_upcall)(tcb,oldstate,newstate);
```

"tos" is the Internet type-of-service field. This parameter is passed along to IP and is included in every datagram. The actual precedence value used is the higher of the two specified in the corresponding pair of open_tcp calls.

open_tcp returns a pointer to an internal Transmission Control Block (tcb). This "magic cookie" must be passed back as the first argument to all other TCP calls. In event of error, the NULL pointer (0) is returned and net_error is set to the reason for the error.

The only limit on the number of TCBS that may exist at any time (i.e., the number of simultaneous connections) is the amount of free memory on the machine. Each TCB on a 16-bit processor takes up about 134 bytes; additional memory is consumed and freed dynamically as needed to buffer send and receive data. Deleting a TCB (see the delete_tcb call) reclaims its space.

```
/* Send data on a TCP connection */
int
send_tcp(tcb,bf)
struct tcb *tcb;          /* TCB pointer */
struct mbuf *bf;          /* Pointer to user's data mbufs */
```

"tcb" is the pointer returned by the open_tcp() call. "bf" points to the user's mbuf with data to be sent. After being passed to send_tcp, the user must no longer access the data buffer. TCP uses positive acknowledgments with retransmission to ensure in-order delivery, but this is largely invisible to the user. Once the remote TCP has acknowledged the data, the buffer will be freed automatically.

The length of the send queue is limited by the constant DEF_WIND in tcp.h. An attempt to queue more than this amount of data for transmission will cause send_tcp to reject the entire request, set net_error == EWOULDBLK, and return -1. Otherwise the number of bytes actually queued for transmission is returned, which should equal "cnt".

```
/* Receive data on a TCP connection */
int
recv_tcp(tcb,bf,cnt)
struct tcb *tcb;
struct mbuf **bf;
int16 cnt;
```

recv_tcp() passes back through bf a pointer to an mbuf chain containing any available receive data, up to a maximum of "cnt" bytes. The actual number of bytes received (the lesser of "cnt" and the number pending on the receive queue) is returned. If no data is available, net_error is set to EWOULDBLK and -1 is returned; the r_upcall mechanism may be used to determine when data arrives. (Technical note: "r_upcall" is called whenever a PUSH or FIN bit is seen in an incoming segment, or if the receive window fills. It is called

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before an ACK is sent back to the remote TCP, in order to give the user an opportunity to pissyback any data in response.)

When the remote TCP closes its half of the connection and all prior incoming data has been read by the local user, subsequent calls to `recv_tcp` return 0 rather than -1 as an "end of transmission" indicator.

```
/* Close a TCP connection */
close_tcp(tcb)
struct tcb *tcb;
```

This tells TCP that the local user has no more data to send. However, the remote TCP may continue to send data indefinitely to the local user, until the remote user also does a `close_tcp`. An attempt to send data after a `close_tcp` is an error.

```
/* Delete a TCP connection */
delete_tcp(tcb)
struct tcb *tcb;
```

When the connection has been closed in both connections and all incoming data has been read, this call is made to cause TCP to reclaim the space taken up by the TCP control block. Any incoming data remaining unread is lost.

```
/* Dump a TCP connection state */
state_tcp(tcb)
struct tcb *tcb;
```

This debugging call prints an ASCII-formatted dump of the TCP connection state on the terminal. You need a copy of the TCP specification (ARPA RFC 793 or MIL-STD-1778) to interpret most of the numbers.

The User Datagram Protocol (UDP)

UDP is available for simple applications not needing the services of a reliable protocol like TCP. A minimum of overhead is placed on top of the "raw" IP datagram service, consisting only of port numbers and a checksum covering the UDP header and user data. Four functions are available to the UDP user.

```
/* Create a UDP control block for lsocket, so that we can queue
 * incoming datagrams.
 */
```

```
int
open_udp(lsocket,r_ucall)
struct socket *lsocket;
void (*r_ucall)();
```

`open_udp` creates a queue to accept incoming datagrams (regardless of source) addressed to "lsocket". "r_ucall" is an optional ucall mechanism to provide the address of a function to be called as follows whenever a datagram arrives:

```
(*r_ucall)(lsocket,rcvnt);
struct socket *lsocket;      /* Pointer to local socket */
int rcvnt;                  /* Count of datagrams pending on queue */
```

```
/* Send a UDP datagram */
int
send_udp(lsocket,fsocket,tos,ttl,be,length,id,df)
struct socket *lsocket;      /* Source socket */
```

```
struct socket *fsocket;      /* Destination socket */
char tos;                    /* Type-of-service for IP */
char ttl;                    /* Time-to-live for IP */
struct mbuf *bf;             /* Data field, if any */
int16 length;                /* Length of data field */
int16 id;                    /* Optional ID field for IP */
char df;                     /* Don't Fragment flag for IP */
```

The parameters passed to send_udp are simply stuffed in the UDP and IP headers, and the datagram is sent on its way.

```
/* Accept a waiting datagram, if available. Returns length of datagram */
int
recv_udp(lsocket, fsocket, bf)
struct socket *lsocket;      /* Local socket to receive on */
struct socket *fsocket;      /* Place to stash incoming socket */
struct mbuf **bf;            /* Place to stash data packet */
```

The "lsocket" pointer indicates the socket the user wishes to receive a datagram on (a queue must have been created previously with the open_udp routine). "fsocket" is taken as the address of a socket structure to be overwritten with the foreign socket associated with the datagram being read; bf is overwritten with a pointer to the data portion (if any) of the datagram being received.

```
/* Delete a UDP control block */
int
del_udp(lsocket)
struct socket *lsocket;
```

This function destroys any unread datagrams on a queue, and reclaims the space taken by the queue descriptor.

RADIO AMATEUR TELECOMMUNICATIONS SOCIETY
206 North Vivyen Street
Bergenfield, NJ 07621

Prepared by: Thomas A. Moulton, W2VY

28 January 1986

Command	Default	Description
8bitconv	OFF	Strip high-order bit when in convers mode
AUtoLf	ON	Send Linefeed to terminal after each CR
AWlen	7	Terminal character length (7/8)
Ax25l2v2	OFF	Run as version 1.0 of AX.25
AXDelay	0	(0-180 * 0.1 sec) Voice Repeater keyup delay
AXHang	0	(0-20 * 0.1 sec) Voice Repeater hang time
Beacon	E 0	Every/After 0-250 *10 sec.
BKondel	ON	Send BS SP BS for each DELETE character
BText		(120 char) Text to be sent for a beacon
BUDlist	OFF	Stations in Lcalls are ignored
CALibra		Used to calibrate the builtin modem
CALSet		Used with CALibrate
CANline	\$18	(Control-X) The Line Delete character
CANPac	\$19	(Ctrl-Y) Cancel current character
CHech	30	(0-250 * 10 sec) Idle link time out
CLKADJ	0	(0-65535) Real time clock adjustment constant
CMDtime	1	(0-255 sec) transparent mode escape timer
CMSG	OFF	Don't send CTEXT when user links to your TNC
COMmand	\$03	Char to escape from CONVERS mode to command mode
CONMode	CONVERS	(or TRANS) Mode to enter when link established
Connect		Establish Link with station via optional stations
CONOK	ON	Allow stations to establish a link with your TNC
CONPerm	OFF	If ON always keep this link up (never Disconnect)
CONStamp	OFF	If ON print date & time stamp on connect messages
CStatus		Prints the status of all links (Streams)
CONVers		Enter Converse mode from command mode
CPactime	OFF	Don't forward data based on timers (see Pactime)
CR	ON	Append a Carriage Return to each data packet
CText		(120 Ch) Connect Message Text (see CMSG)
DAYtime		Date and time for real time clock
DAYUsa	ON	Print date as mm/dd/yy instead of dd-mm-yy
DELeTe	OFF	The character delete is BS (\$08) not DEL (\$7F)
DIGipeat	ON	Allow stations to use you as a Digipeater
Disconne		Request a link disconnect from the other station
Display		(Async/Character/Id/Monitor/Timing) Parameters
DWait	16	(0-250 * 10 msec) Delay to let digipeater repeat
Echo	ON	Echo characters typed on keyboard to terminal
EScape	OFF	Don't translate ESC character (\$1B) to \$ (\$24)
Flow	ON	Don't print to terminal while user is typing
FRack	3	(1-15 sec) Time needed to ack a packet per station
FULLdup	OFF	Operate in Simplex mode
HEaderln	OFF	Print the frame header and text on the same line
HID	OFF	Don't send an ID packet every 9.5 mins when active
ID		Force an ID packet (UI frame Via UNproto path)
LCALLS		(0-8 calls) to receive or ignore stations (BUDLIST)
LCok	ON	Do not convert lower case to UPPER CASE on terminal

RADIO AMATEUR TELECOMMUNICATIONS SOCIETY

Prepared by: Thomas A. Moulton, W2VY

28 January 1986

Command	Default	Description
LCSTREAM	ON	Convert the stream select specifier to Upper case
LFadd	OFF	Add a Line Feed after each CR send to the terminal
MAll	ON	Monitor data frames as well as beacons
MAXframe	4	The window size for outstanding frames
MCOM	OFF	Monitor only data frames instead of all types
MCon	OFF	Don't monitor frames when linked to another station
MFilter		Up to 4 characters to be removed from monitored data
MHClear		Clear the calls Heard list
MHeard		Display the calls heard and date/time if clock set
Monitor	ON	Monitor mode on - see BUDLIST, MALL, MCON, MSTAMP
MRpt	ON	Display the digipeater path in monitored frames
MStamp	OFF	Monitored frames are Not time stamped
MYAlias		An identifier for a digipeater
MYcall	NOCALL	The station callsign for ID and linking
NEwmode	OFF	The TNC acts like a TNC 1 for changing modes
NOmode	OFF	If ON allow explicit mode change only
NUcr	OFF	Don't send NULLS (\$00) after a CR
NULf	OFF	Don't send Nulls after a LF
NULLS	0	(0-30) Number of nulls to send as requested
PacLen	128	(0-255,0=256) size of the data field in a data frame
PACTime	After 10	(Every/After 0-250 *100 ms) Data forwarding timer
PARity	3 (even)	(0-3) Terminal parity 0,2=None 1=odd 3=even
PASs	\$16	(CTRL-V) char to allow any character to be typed
PASSAll	OFF	Accept only frames with valid CRCs
REConnect		Like Connect but to reestablish a link via a new path
REDisplay	\$12	(CTRL-R) char to print the current input buffer
RESET		RESET bBRAM PARAMETERS TO DEFAULTS
RESptime	12	(0-250 * 100 ms) minimum delay for sending an ACK
RESTART		Perform a power on reset
RETry	10	(0-15) maximum number of retries for a frame
ScreenLn	80	(0-255) Terminal output width
Sendpac	\$0D	(CR) Char to force a frame to be sent
STArT	\$11	(CTRL-Q) the XON for data TO the terminal
STOp	\$13	(CTRL-S) the XOFF for data TO the terminal
STREAMCa	OFF	Don't show the callsign after stream id
STREAMDb1	OFF	Don't print the stream switch char twice (!!A)
STReamsw	\$7C (!)	Character to use to change streams (links)
TRAcE	OFF	Hexidecimal trace mode is disabled
TRANS		The TNC enters Transparent data mode
TRFlow	OFF	Disable flow control to the Terminal (Trans mode)
TRies		(0-15) set or display the current retry counter
TXdelay	30	(0-120 * 10ms) Keyup delay for the transmitter
TXFlow	OFF	Disable flow control to the TNC (Transparent mode)
Unproto	CQ	Path and address to send beacon data
USers	1	Sets the number of streams (links) allowed
Xflow	ON	XON/XOFF Flow control enabled instead of hardware
XMitok	ON	Allow transmitter to come on
XOff	\$13	(CTRL-S) Character to stop data from terminal
XON	\$11	(CTRL-Q) Character to start data from terminal

THE **ARRL** Letter

Volume 5, Number 3

January 30, 1986

ARRL Board Meets: Blasts FCC Slap at Packet Radio, Says "Yes" to National Repeater Data Base

The ARRL Board of Directors held its 1986 first meeting in Hartford, Connecticut, on January 23 and 24. Here's a summary of major actions taken, grouped, as much as possible, by subject.

Organizational matters. President Larry E. Price, W4RA, was reelected to serve until the 1988 annual meeting. Also reelected were Executive Vice President David Sumner, K1ZZ, Secretary Perry Williams, W1UED, and Treasurer James E. McCobb, Jr., K1LLU. Newly elected as First Vice President was Jay A. Holladay, W6EJJ. Leonard M. Nathanson, W8RC, and William J. Stevens, W6ZM, were elected as Vice Presidents. Tod Olson, KØTO, is the new International Affairs Vice President. Replacing Olson as Dakota Division Director is the present Vice Director, Howard Mark, WØOZC. Serving on the Executive Committee, in addition to Messrs. Price, Holladay and Sumner, will be Directors Paul Grauer, WØFIR, George S. Wilson, W4OYI, Frank M. Butler, Jr., W4RH, and Hugh A. Turnbull, W3ABC, until the 1987 annual meeting.

At Minute 51, it was voted that the job description for the Section Public Information Officer be modified to include the responsibility for establishing a speakers bureau within the Section to provide amateurs to present talks on Amateur Radio to non-amateur groups including schools, service clubs, civic groups, etc. Minute 54 orders that a brochure explaining Amateur Radio disaster capabilities, suggested by the Emergency Communications Advisory Committee, be produced and distributed to the media and served agencies. At Minute 60, it was resolved that ARRL explore the possibilities of Memoranda of Understanding with the National Weather Service and Civil Air Patrol. Minute 70 continued this theme: the Executive Vice President was directed to

implement the staff plan to actively promote Local Memoranda of Understanding for use by Amateur Radio Emergency Service officials, as approved by the Volunteer Resources Committee. At Minute 73, the President is empowered to appoint a Special Study Committee to take a close look at all Advisory Committees, including their size, selection of members, tenure and financing. At Minute 75, it was voted that the HQ staff prepare, in consultation with experienced members in the field, a guidebook for sponsoring conventions and hamfests. At Minute 77, it was voted that the ARRL Board create a "Legal Strategy Committee." The Committee will work with the Volunteer Resources Committee to enhance the Volunteer Counsel Program by providing assistance in matters related to antenna ordinances, zoning restrictions as they relate to antenna operations, and deed restriction problems. At Minute 78, it was voted that HQ staff be directed to forward to new Section Managers a complete sampling of all forms, handouts, brochures and pamphlets relevant to the Field Organization that are available from League HQ. Further, whenever a new form, handout, brochure or pamphlet is developed, it shall be promptly forwarded to all Section Managers. At Minute 81, the Executive Vice President was instructed to develop a program of special encouragement and support to Amateur Radio Clubs located at US military installations, particularly those at which communications and electronics training are performed, and to pursue with MARS organizations the possibility of enhanced MARS operations at these sites, with training of new amateur licensees a primary objective. Minute 83 authorizes the implementation of a program authorizing ARRL Field Organization volunteers to purchase distinctive official ARRL callsign badges.

The Board took two actions looking forward to ARRL's 75th anniversary in 1989: ARRL will offer to host the 1989 Triennial meeting of IARU Region 2, and criteria for selecting the 1989 ARRL National Convention site were adopted. These criteria will be published in the March and April issues of QST, and selections made at the Board's July 24 meeting.

Packet radio. At Minute 53, it was voted that the League take the necessary actions to **cause FCC Docket 85-105 to be amended to correct its restrictive and crippling effect on the development of packet radio** and packet-radio emergency communications caused by the requirement that a control operator be present at each domestic intermediary relay point for transmission of third-party traffic.

FCC/Regulatory/Licensing. At Minute 92, plans to continue discussing the possibility of League involvement in call sign issuance with the FCC were left in place, despite some expressed misgivings. At Minute 88, it was unanimously voted that the League file with FCC a petition requiring the labelling of home electronic equipment with regard to its susceptibility to RF energy. At Minute 94, it was voted that the President represent to the FCC that **all Volunteer Examiner Coordinators** be required equally to perform all administrative and clerical functions required of any VEC. Minute 103 announces that FCC will be petitioned to modify Section 97.313 of its Rules so as to specify that, in accordance with IARU recommendations, overseas operators, when operating in the US under the terms of reciprocal operating permits, will sign their US call-area designators **before** their foreign callsigns — ie, W4/DL6TJ rather than DL6TJ/W4.

Repeaters. In the August 1 Letter, we reported that the Board had voted, at its July 1985 meeting, that a study be made of the costs of maintaining a national repeater data base in support of local and regional coordination efforts. At Minute 79 of the meeting just past, **it was voted that the database be implemented — the national repeater database will be a reality.** With regard to its operation, this resolution was adopted at Minute 84:

To implement the Board's previous insulation of the League from repeater coordination activities, BE IT RESOLVED that access to a League repeater data

base or publication does not constitute nor imply endorsement or recognition of the authority of such coordinators. Upon being advised by a disputant of a bona fide dispute concerning the authority of one having access, further authority to input data as to the subject area of the dispute will be suspended pending its resolution.

Appropriate caveats will be made in the Repeater Directory as to the disassociation of the League from coordination and certification of coordinators, and pointing out that the coordinators and not the League represent the fact of coordination of repeaters in future issues of the Directory.

League Officials will be reminded that the League, as a matter of policy, takes no part in the coordination process and will be directed to govern their actions accordingly.

At Minute 64, it was voted that the Repeater Coordinators' Newsletter be offered for sale to the general membership of the League while continuing its free distribution to repeater coordinators.

Operating/awards. At Minute 61, the Board adopted a **160-meter band plan**. The League recommends 1800-1840 kHz for CW, RTTY and other narrow-band modes, 1840-2000 kHz for CW, SSB, SSTV and other wide-band modes, and further recommends that only intercontinental QSOs take place at 1830-1850 kHz. The Board did not agree to a proposal that these subbands should be incorporated in the FCC rules at this point. At Minute 27, it was voted that the President is to actively pursue persuading IARU to adopt a policy regarding awards credit for contacts made on 10 MHz, similar to that of ARRL. **Concerning 18 and 24 MHz**, a motion was adopted at Minute 50 that **ARRL awards credit** other than for five-band awards **be recognized for all Amateur Radio bands.** More on this theme at Minute 67, where it was voted that **credit for Field Day contacts be granted** for all bands save 10 MHz. Minute 52 informs us that the Membership Services Committee will develop a plan for a special Golden Jubilee DXCC Award.

Studies. Minute 45 tells us that these items are to be studied: (a) designation of packet radio channels; (b) development of activity for youngsters in radio clubs; (c) plastic holder for existing ARES card (d) the Public Information Officer/Public

Information Assistant and club public relations roles; (e) the club liability insurance plan; (f) listing packet stations in a Directory; (g) costs of diskettes of Call Directory Information; (h) study recommended operating frequencies for VHF and HF packet radio; (i) feasibility of producing a videotape to train Emergency Coordinators and ARES members; (j) operating practices at W1AW; (k) acquisition of video tapes which depict amateur radio activities/subjects. At Minute 49, the Publications Committee will study the feasibility of combining present ARRL newsletters into a single, inexpensively produced publication able to carry material in a more timely and cost-effective manner than separate newsletters, to be made more widely available to the ARRL membership. At Minute 66, we learn that the President will appoint a Blue Ribbon Committee for study and recommendations as to methods of handling message traffic overloads during an emergency. At Minute 69, the Membership Services Committee is to study the establishment of a tape-recorded news and information service to be accessed by telephone. Minute 86: The Committee will also review, along with the Contest Advisory Committee, the present three-tier club competition plan to ensure that club categories are reasonable.

The complete Minutes will appear in March QST. Perhaps best concluding this roundup of the Board's January meeting is this, from Minute 16: In his written report President Price pointed out that in 1985, the League had a near-record growth in membership, about 15,000, or 12% over 1984. Obvious, he said, are the gains that have been achieved in staff and management efficiency. Other achievements for 1985 are detailed in the editorial of January, 1986, which was made part of the report. In the coming year, the President said, we must have even more League members in order to enlarge our financial base and we must have even more radio amateurs if we are to continue to be seen by governmental decision makers as a growing and vital service. Sometime in the 1990's, Mr. Price warned, it may become necessary for radio amateurs worldwide to once again face the perils of an allocations conference of the International Telecommunication Union. In brief oral remarks, the President urged League officials to think positively about Amateur Radio's future and "to talk up Amateur Radio, to talk up ARRL."

FCC SAYS YES TO 7075-7100-kHz PHONE IN CARIBBEAN INSULAR AREAS

FCC has adopted a Report and Order in PR Docket 85-104, allowing telephony operation at 7075 to 7100 kHz by General, Advanced and Amateur Extra licensees south of 20 degrees north latitude. The new privileges are expected to have minimal impact on non-voice operation in this segment by stations on the US mainland, while granting much-needed relief from 7100-7300-kHz foreign broadcasting to telephony operation in Caribbean insular areas. This amendment to Part 97 is effective 0001 UTC February 28, 1986.

UNITED KINGDOM ALLOCATES 50 MHz TO AMATEURS

In the August 1, 1985 Letter, we reported that a UK 6-meter allocation was imminent. Six months, we figure, was "imminent" enough: the Radio Society of Great Britain has announced the availability of 50.0-50.5 MHz to UK amateurs from February 1!

This allocation is made by the Department of Trade and Industry (DTI), Britain's "FCC." Among the conditions under which amateurs in the UK may use their new 6-metre privileges are effective radiated power maxima of 14 dBW carrier (25W) and 20 dBW (100W) PEP. Transmitting antenna height is limited to 20 metres above ground level. No mobile, portable or temporary-premise operation will be allowed. The new privileges are available only to Class A licensees in the UK.

With these new privileges come new responsibilities. A look at the Table of Frequency Allocations in the International Telecommunication Union's Radio Regulations shows 47-68 MHz as allocated to broadcasting. A government may allocate frequencies at variance with the Table if no harmful interference is caused to stations using frequencies allocated in accordance with the Table. It's this way with the UK's 6-metre band: DTI has made 50.0-50.5 MHz available with the caveat that harmful interference not be caused the few European television stations operating in that frequency range. Specifically mentioned is the station at Antwerp, Belgium, operating on channel E-2 (video/aural carrier frequencies of 48.25 and 53.75 MHz, respectively) with 100 watts of video and 10 watts of audio. DTI reserves the right to modify the UK 6-metre allocation should

harmful interference from radio amateurs become a problem.

SPIRITUALITY

January 29, 1986. The American flag in the front parking lot at ARRL HQ was flying at half-mast as this writer arrived for work at 9 AM. You know the reason. Seven of us had embarked on a quest the previous day, never to return. Another of us, the President of the United States, had eulogized them later on that terrible day. "We will never forget them," Ronald Reagan said. "nor the last time we saw them, this morning, as they prepared for their journey and waved goodbye, and slipped through the surly bonds of earth, to touch the face of God."

They rose aboard a species of machine, a machine called Shuttle Challenger. We have had great success with machines. Less than a week before Challenger took to the sky, we'd ohhed and ahhed images brought us by another stupendous machine: Voyager 2, away from Earth for so many years, chugging out those stunning vistas of Uranus and its moons, signals taking so many minutes to reach us, pictures so clear. What a machine! Some of us — radio amateurs, we're called — may even have witnessed the retransmission of some of those images in our amateur bands, from the Jet Propulsion Laboratory, from W6VIO, just as many of us may have heard Amateur Radio signals emanating from Challenger so few months ago, when several of our number were part of her crew — all brought us by our collective handiwork: wondrous machines, systems going well, networks holding together. But recall that there were cold eyes in a mindless construct feeding us those images; it took our imaginations and intellects, after our eyes and brains had scanned the images from Voyager, to do the ohing and ahing, the dreaming — and the going on.

This is why there were seven people aboard Challenger on January 28, 1986. It's too inhospitable out there near Saturn and Uranus, sure — our machines haven't yet been perfected to the point where they'll get any of us out there to do the real-time real-space dreaming and get us safely home again. So we send a machine and prepare to be thrilled from afar. We don't stand for this "thrilled from afar" stuff any longer than we need to, though. The idea is to get out there and do it ourselves. The intent is to feel the real hands grasping the actual controls, to let the true light fall

on the living retinas. Why? Because our push into space is arguably the greatest spiritual quest on which humans may collectively embark. It's in the blood, it's built into our cells.

"Whoa, The ARRL Letter's talking spirituality; break out the Halon extinguishers!" Not at all. The first experiments trying to crack the radio "nut" last century were part of the same spiritual quest to which the Challenger crew were committed. Our first lispy blurps on five meters were more of the same. We got there with machines of wire and glass, and with deceptively little risk, but with machines no less wondrous even if tossed together on a kitchen shelf. The goal, this writer insists, is primordial: humankind, Us with a capital 'u,' expanding beyond where and what we are — an enormous slow yearning over myriad generations to push from the known into the unknown. The expansion of mankind right before its own eyes. If that isn't spirituality, what is? Sure, our society is vast, the means through which we individually participate in the push into space democratic and bureaucratic — long concatenations of taxes, politicians and specialists between each of us and those chosen to "push back the envelope" — but the quest is what it has always been: utter spirituality, everything on the line.

That's why the slug in the gut when we saw Challenger fall. **That's** why the dazedness, the anger, the flags at half mast. Seven of us we **instinctively** realize we had utterly accepted — and loved — as our proxies in that quest, gone. No rejoicing, as we'd planned — but still the dreaming, and the going on.

January 28, 1986

Gregory B. Jarvis	Ellison S. Onizuka
Christa McAuliffe	Judith A. Resnik
Ronald E. McNair	Francis R. Scobee
Michael J. Smith	

THE ARRL LETTER is published bi-weekly by the American Radio Relay League, 225 Main Street, Newington CT 06111; (203) 666-1541; Larry E. Price, W4RA, President; David Sumner, K1ZZ, Executive Vice President; David Newkirk, AK7M, Editor; Debra Chapor, ARRL LETTER Circulation. The purpose of THE ARRL LETTER is to provide the essential news of interest to active, organizationally minded radio amateurs in the United States faster than it can be disseminated by the League's official journal, QST. We strive to be fast, accurate and readable in our reporting.

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Subscriptions, limited to ARRL members, are \$19.50 (U.S. Funds) per year for First-Class Mailing to the U.S., Canada and Mexico. Overseas air mail subscriptions are available at \$31 (U.S. funds) per year.

Before the
Federal Communications Commission
Washington, D. C. 20554

PR
FCC 86-18
36413

In the Matter of)	
)	
Amendment of Part 97 of the)	PR Docket No. 85-105
Commission's Rules to permit)	
automatic control of amateur)	RM-4879
radio stations.)	

REPORT AND ORDER

Adopted: January 13, 1986 ; Released: January 16, 1986

By the Commission:

1. On April 5, 1985, the Commission adopted a Notice of Proposed Rule Making (50 F. R. 15196; April 17, 1985) to permit any amateur station to be under automatic control provided that operation was on frequencies above 29.5 MHz and that no third-party traffic was transmitted. This was an expansion of the proposal requested by The American Radio Relay League, Inc. (ARRL), who had requested automatic control only for stations transmitting digital communications while operating on frequencies above 30 MHz. Nineteen comments and one reply comment were filed in this proceeding.¹

2. Our Notice of Proposed Rule Making in this proceeding, supra, particularly invited amateur radio operators experienced in automatic control to submit comments on the practicality of expanding automatic control to encompass all amateur operations, not just digital communications. Such comments were not forthcoming. Because of the lack of user support, we will adopt only the ARRL's recommendation to limit automatic control to digital communications on very high frequencies (VHF) and above. (We select 50 MHz rather than 30 MHz, as the petitioner requests, because there are no amateur frequencies between 29.7 and 50 MHz).

¹ Comments filed by the American Radio Relay League, Inc., (ARRL), Robert C. Clements, Jess de la Cuesta and Joseph Anthony Wolos were filed late. Consideration of the viewpoints expressed in those comments will aid in the resolution of this proceeding. Therefore, we accept them.

3. In the Notice, supra, we reminded amateur operators that the current rules require the presence of the control operator at the station control point whenever third-party traffic is being transmitted. We emphasized that the proposed amendments would still prohibit automatic control of the station when it is transmitting third-party traffic. Some commenters were confused about unsupervised third-party traffic. For example, repeater stations are already permitted to be operated under automatic control. However, as with any amateur station, when they are transmitting third-party traffic, the control operator must be present at the control point monitoring and supervising the transmissions.

4. Many of the commenters request that high-speed digital operating modes, such as packet-switching, bulletin boards, computer based message systems and electronic mailboxes be exempt from the requirement that the control operator supervise third-party traffic. They believe that the third-party rules as applied to such high-speed digital communications are impracticable and would, in effect, nullify the advantages of automatic control. To acquiesce in that request would be inconsistent with other types of amateur operation. Third-party traffic is radio communications on behalf of anyone other than the control operator.² Neither the speed at which the message is transmitted nor the emission mode (voice, telegraphy, digital etc.) changes its character. This was pointed out in our letter of October 19, 1978, to Richard L. Baldwin, then General Manager of the ARRL.³ In that letter, we reiterated that unsupervised third-party traffic by amateur stations is not permitted.

5. Some comments suggest that the third-party traffic rules be amended so that they would be applicable only at the time the third-party traffic is first introduced into the amateur communications system. However, screening the message content at its introduction does not change the character of the traffic. It is still third-party traffic which must be closely regulated in the non-common carrier Amateur service. Otherwise, amateur facilities and frequencies would be open to non-amateurs and could eclipse other amateur uses. Moreover, we are also concerned about the final destination of the message. We do not want to give our approbation to a mechanism which could be used to circumvent the International Radio Regulations which forbid exchange of amateur third-party traffic between countries who are not parties to agreements permitting such traffic.

2 Section 97.3(v).

3 FCC 78-742; 70 F.C.C. 2d 1303. See also News Release No. 2028, October 25, 1978.

13. Information in this matter may be obtained by contacting Maurice J. DePont, (202) 632-4964. Private Radio Bureau, Federal Communications Commission, Washington, D.C. 20554.

FEDERAL COMMUNICATIONS COMMISSION

William J. Tricarico
Secretary

Attachment: Appendix

APPENDIX

Part 97 of Chapter I of Title 47 of the Code of Federal Regulations is amended, as follows:

1. The authority citation for Part 97 continues to read as follows:

Authority citation: 48 Stat. 1066, 1082, as amended;
47 U.S.C. 154, 303.

2. Section 97.3 (m) (3) is amended to read:

§ 97.3 Definitions.

* * * * *

(m) * * *

(1) * * *

(2) * * *

(3) Automatic control means the use of devices and procedures for control without the control operator being present at the control point when the station is transmitting.

3. Section 97.79 (b) is amended to read:

§ 97.79 Control operator requirements.

* * * * *

(b) Every amateur radio station, when transmitting, must have a control operator. The control operator must be present at the control point of the station, except when the station is transmitting under automatic control. The control operator must be a licensed amateur radio operator or permittee designated by the station licensee. The control operator and the station licensee are both responsible for the proper operation of the station. For purposes of enforcement of the rules of this part, the FCC will presume that the station licensee is the control operator of the station, unless documentation to the contrary exists.

4. Section 97.69 is amended by adding a new paragraph (d), as follows:

§ 97.69 Digital communications.

* * * * *

(d) An amateur station may be under automatic control when transmitting digital communications on frequencies 50 MHz and above.

5. A new section 97.80 is added, as follows:

§ 97.80 Operation under automatic control.

(a) When under automatic control, devices must be installed and procedures must be implemented which will ensure compliance with the rules when the control operator is not present at the control point of the amateur station.

(b) No amateur station may be operated under automatic control while transmitting third-party traffic.

(c) Automatic control of an amateur station must cease upon notification by the Engineer-in-Charge of a Commission field office that the station is transmitting improperly or causing harmful interference to other stations. Automatic operation must not be resumed without prior approval of the Engineer-in-Charge.

6. Section 97.114 is amended by adding a new subparagraph (4) to paragraph (b) as follows:

§ 97.114 Third-party traffic.

* * * * *

(b) * * *

(4) Third-party traffic from an amateur station under automatic control.

* * * * *

DARC

Deutscher Amateur-Radio-Club e.V. Postfach 1155, 8507 Baunatal, Tel. 056 749 26 04
Mitglied der International Amateur Radio Union



Hans Berg Mengstr.37 D-24 Lübeck 1

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· Paul L. Rinaldo
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International Liaison Officer

HANS BERG (DJ6TJ)

Mengstr. 37
D-2400 LÜBECK 1
Fed. Rep. of Germany

Ihre Zeichen, Ihre Nachricht vom
Jan. 27, 1986

Unsere Zeichen, unsere Nachricht vom

(49)

O451 70891
QRL 71427

Datum: Feb. 15, 1986

Betreff ARRL Ad Hoc Committee on AR Digital Communication

Dear Paul:

I read your above mentioned letter with great interest. As you surely know a big number of DARC members are interested in that matter and our RTTY committee (BUS) is coordinating this matter here. For that reason I ask you very kindly to put DARC Headquarters on your future mailing list.

As far as HF is concerned I would also be glad to receive a copy as the IARU Region 1 HF WG chairman.

March 8-9 this year there are the meetings of the VHF and HF WG of Region 1 in Vienna. PR is also on the agenda. I am very sure both WG's to propose the AX 25 protocol for our Region. If you have some comments for our meeting, please do not hesitate to contact me.

I think we met personally two years ago when visiting ARRL HQ, didn't we ?-
Please tell my regards to Dave, K1ZZ.

VY 73's

Hans

DJ6TJ

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Commerzbank

Lübeck

Kto 116111

RECEIVED

Before the
FEDERAL COMMUNICATIONS COMMISSION FEB 28 1986
Washington, D.C. 20554

FCC

Office of the Secretary

In the Matter of)

)
Amendment of Part 97 of)
the Commission's Rules to)
Permit Automatic Control of)
Amateur Radio Stations)

PR Docket No. 85-105

To: The Commission

PETITION FOR EXTRAORDINARY RELIEF

The American Radio Relay League, Incorporated (the "League") hereby respectfully requests that, until final Commission action is taken on the League's Petition for Partial Reconsideration filed in this proceeding February 24, 1986, the Commission rescind its prohibition on transmission of third-party traffic by amateur stations under automatic control on frequencies above 50 MHz, under certain circumstances. As good cause for this request,^{1/} the League states as follows:

1. On January 16, 1986, the Commission released a Report and Order in this proceeding, FCC 86-18, 51 Fed. Reg. 3069, which amended various sections of Part 97 of the Rules. Said amendments, effective March 14, 1986, permit automatic control of digital communications above 50 MHz in the Amateur Radio Service,

^{1/} The request is in the nature of a request for partial stay pursuant to §1.429(k) of the Rules.

as per the League's request in RM-4829. However, the Report and Order also established an absolute prohibition on the transmission of third-party traffic by amateur stations while operated under automatic control. This prohibition threatens to undermine the efforts of more than 14,000 radio amateurs to take the initial steps toward establishment of an amateur packet radio network for the rapid and accurate relaying of messages and other data. The League has been informed by Commission staff that some nineteen Petitions for Reconsideration (including that of the League) have been filed in this proceeding, and that a considerable period of time will be required for the processing thereof even if the matter is accorded priority attention.

2. In the meantime, the new language prohibiting third-party traffic transmitted by amateur stations under automatic control, if permitted to take effect on March 14, 1986, will have a chilling effect^{2/} on the development of packet radio by amateurs. The effect of the prohibition has caused sufficient concern among amateurs that some small businesses serving the amateur radio community may be placed in serious financial jeopardy. Accordingly, the League now requests that the Commission temporarily lift the prohibition on third-party traffic

^{2/} Such effect has already been obvious, even before the effective date of the Report and Order, inasmuch as the same characterized the prohibition as the application of an existing rule. But see ¶3, infra.

being transmitted by stations under automatic control on frequencies above 50 MHz. The following limitations are suggested, in the interest of minimizing the possibility of abuse.

- (A) The relief requested herein would apply only to amateur stations using digital communications above 50 MHz, and only to the retransmission of third-party messages originated by another amateur station not under automatic control;
- (B) To ensure the widest possible monitoring capability of messages sent as the result of grant of this Petition, relief is requested only for packet radio transmission using, or compatible with, the AX.25 protocol; and
- (C) The lifting of the prohibition shall apply only during the pendency of the reconsideration proceeding.

3. While the Report and Order stated that the prohibition of third-party traffic transmission by amateur stations under automatic control was not a new restriction, the practical effect is to introduce a new restriction because the previous policy had been articulated only with regard to autopatch operation by repeater stations^{3/} and not specifically applied to digital communications. Despite the widespread use of VHF packet radio stations to relay messages, operating under the rules applicable to repeaters, no statement by the Commission nor enforcement

^{3/} See FCC 78-742; 70 FCC 2d 1303 (1978).

action or threat of such action, has ever been aimed at curbing the practice. Indeed, such would have been inconsistent with the Commission's long-espoused support of the development of packet radio as an effective public-service and disaster communications tool.

4. No harm can result from grant of the relief sought herein, inasmuch as a licensed operator will be required in order to introduce any message into the network before it can be re-transmitted automatically. Further, thousands of amateurs can and will be monitoring (albeit not necessarily in real time) with equipment capable of receiving, recording in memory, and displaying any communication conducted pursuant to authority granted hereunder.

THEREFORE, good cause having been stated for the extraordinary relief requested, the American Radio Relay League, Incorporated respectfully requests that, until a final Order is entered resolving the issues raised in the League's February 24 Petition for Partial Reconsideration in this proceeding, the Commission waive, suspend, or hold in abeyance the prohibition of third-party message traffic transmitted by amateur stations while

under automatic control, when such stations are operated under the limited conditions set forth hereinabove.

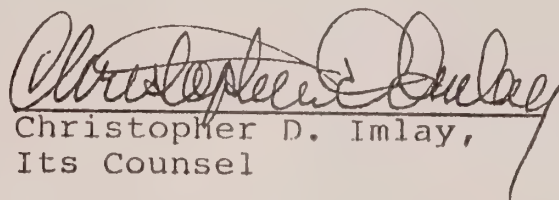
225 Main Street
Newington, CT 06111

Respectfully submitted,

THE AMERICAN RADIO RELAY
LEAGUE, INCORPORATED

Booth, Freret & Imlay
1920 N Street, N.W., Suite 520
Washington, D.C. 20036
(202) 296-9100

By:


Christopher D. Imlay,
Its Counsel

February 28, 1986

IARU REGION II BULLETIN NR 131-E
NEWINGTON CT FEB. 19, 1986
TO ALL MEMBER SOCIETIES REGION II / ALL RADIO AMATEURS

WELCOME TO THE IARU REGION 2 RTTY BULLETIN.

///

WE NOW CONTINUE WITH THE RESOLUTIONS APPROVED BY THE ADMINISTRATIVE COUNCIL AT ITS NOVEMBER 1985 MEETING.

RESOLUTION 85-7 CONCERNING PACKET RADIO REGULATIONS.

RECOGNIZING THAT THE USE OF PACKET RADIO TECHNIQUES DEVELOPED IN THE AMATEUR SERVICE IS SIGNIFICANTLY ENHANCING THE ABILITY OF RADIO AMATEURS TO COMMUNICATE DATA QUICKLY AND ACCURATELY,

RECOGNIZING THAT ONE OF THE TECHNIQUES RESPONSIBLE FOR THIS ENHANCEMENT IS THE ABILITY TO FORWARD DATA THROUGH A SERIES OR NETWORK OF PACKET RADIO STATIONS, WITHOUT OPERATOR INTERVENTION AND,

NOTING THAT THIS ABILITY ADDS A NEW, VERY WORTHWHILE DIMENSION TO THE CAPABILITY OF THE AMATEUR SERVICE TO RESPOND TO THE RESPONSIBILITIES FOR DISASTER COMMUNICATIONS ENUMERATED IN RESOLUTION 640 ADOPTED BY THE WORLD ADMINISTRATIVE RADIO CONFERENCE, GENEVA, 1979,

NOTING, HOWEVER, THAT NEITHER THE INTERNATIONAL RADIO REGULATIONS NOR DOMESTIC REGULATIONS OF MANY COUNTRIES WERE DRAFTED WITH PACKET RADIO COMMUNICATION IN MIND,

RESOLVES THAT THE INTERNATIONAL SECRETARIAT, IN ITS CAPACITY AS THE INTERNATIONAL CLEARING HOUSE OF INFORMATION RELATING TO PACKET RADIO ON BEHALF OF THE IARU, IS INVITED:

1. TO REVIEW ARTICLE 32 OF THE INTERNATIONAL RADIO REGULATIONS, AND TO IDENTIFY FOR THE ADMINISTRATIVE COUNCIL THE MODIFICATIONS THAT MAY BE REQUIRED TO FACILITATE THE DEVELOPMENT OF THE WORLD WIDE PACKET RADIO NETWORK, BEARING IN MIND THE CONCERNS HELD BY ADMINISTRATIONS REGARDING SUCH COMMUNICATIONS,
2. TO COLLECT FROM MEMBER SOCIETIES INFORMATION ON HOW THEIR DOMESTIC REGULATIONS LIMIT OR FACILITATE THE DEVELOPMENT OF PACKET RADIO, WITH THE OBJECTIVE OF DETERMINING WHAT COMMON PROBLEMS MAY EXIST, AND
3. TO DEVELOP RECOMMENDATIONS FOR THE ADMINISTRATIVE COUNCIL CONSIDERATION AS HOW THESE PROBLEMS SHOULD BE ADDRESSED, WITH A REPORT TO BE RENDERED SHORTLY PRIOR TO THE NEXT MEETING OF THE ADMINISTRATIVE COUNCIL.

THE SECOND RESOLUTION FOR THIS BULLETIN IS RESOLUTION NUMBER 85-8, CONCERNING QSL BUREAUS.

THE IARU ADMINISTRATIVE COUNCIL,

RECOGNIZING THAT THE EXCHANGING OF QSL CARDS IS A FINAL COURTESY IN AN AMATEUR RADIO COMMUNICATION,

RECOGNIZING THAT THE COST OF EXCHANGING CARDS BETWEEN INDIVIDUAL AMATEUR STATIONS IS PROHIBITIVE IN MOST CASES, UNLESS AN EFFICIENT INTERNATIONAL BUREAU SYSTEM IS IN OPERATION,

RECOGNIZING THAT AN AMATEUR WHO SENDS A CARD VIA THE BUREAU USUALLY HAS NO WAY OF KNOWING WHETHER THE AMATEUR TO WHOM IT IS ADDRESSED IS A MEMBER OF HIS NATIONAL IARU SOCIETY, AND

RECOGNIZING THAT MOST IARU MEMBER SOCIETIES OPERATE INCOMING BUREAU SYSTEMS THAT ARE AVAILABLE TO MEMBERS AND NON-MEMBERS ALIKE, BUT THAT SOME ARE UNABLE, FOR GOOD AND SUFFICIENT REASON, TO PROVIDE SERVICE TO NON MEMBERS EVEN IF THE EXPENSES OF DOING SO ARE FULLY REIMBURSED,

RESOLVES THAT MEMBER SOCIETIES ARE STRONGLY ENCOURAGED, WHENEVER POSSIBLE, TO PROVIDE INCOMING QSL BUREAU SERVICE TO NON MEMBERS WITHIN THEIR OPERATING TERRITORY, IF SUCH MEMBERS AGREE TO PAY THE FULL COST OF THIS SERVICE, AND

FURTHER RESOLVES THAT MEMBER SOCIETIES SHALL NOT FORWARD QSL CARDS TO BUREAUS OPERATED BY NON MEMBERS OF IARU, IF THERE IS AN IARU MEMBER SOCIETY IN THE COUNTRY CONCERNED THAT FORWARDS CARDS TO NON MEMBERS WHO AGREE TO PAY THE FULL COST OF THIS SERVICE.

////
IN THE LAST THREE BULLETINS, WE HAVE PUBLISHED VARIOUS IMPORTANT RESOLUTIONS TAKEN BY THE ADMINISTRATIVE COUNCIL AT ITS LAST MEETING. AFTER THE ACTION OF THE AC, IT WAS DETERMINED THAT THE OLD MISCELLANEOUS RULES ARE NO LONGER APPLICABLE AND HAVE BEEN SUPERSEDED BY ADMINISTRATIVE ACTION.

////
WE ARE VERY PLEASED THAT ALREADY A NUMBER OF SOCIETIES HAVE STARTED TO SEND INFORMATION REGARDING THEIR ATTENDANCE AT BAIRES 86. WE HAVE ALREADY RECEIVED A NUMBER OF PRE REGISTRATION FORMS, INDICATING A VERY GOOD ATTENDANCE AT THE CONFERENCE. IF YOU HAVE NOT SENT IN YOUR PRE REGISTRATION FORM, PLEASE DO SO NOW.

////
INFORMATION FOR OR REGARDING THIS BULLETIN SHOULD BE SENT TO THE IARU REGION 2 SECRETARY:

ALBERTO SHAIQ, HK3DEU
9 SIDNEY LANIER LANE
GREENWICH, CT 06638
USA

RECEIVED

JAN 21 1986

Before the
FEDERAL COMMUNICATIONS COMMISSION

Washington, D.C. 20554

FCC
Office of the Secretary

In the matter of

) RM-5241

)

Creation of a new radio class

)

and allocation of spectrum for

)

the owners of personal computers

)

)

#2

TO: The members of the Commission)

RESPONSE TO OPPOSITION COMMENTS

FROM THE PUBLIC, ARRL AND MST

FILED BY

Donald L. Stoner, W6TNS

January 20, 1985

OVERALL IMPRESSIONS

The petitioner anticipated significant opposition on the part of radio amateurs. It was a pleasant surprise to find that this was not the case. Responses from the general public (both amateur and non-amateur) were slightly more than 2 to 1 in favor of concept (or some variation of it). Hopefully, this proportion is reflected in the comments received by the Commission. The ARRL response was the only comment which denied the need for this public service.

A letter from Harold A. Helms, Ph.D. (WA4QLA) is typical. Dr. Helms states "I have no fundamental objection to the concept of a PDRS; in fact, I would probably use such a service myself".

Several amateurs, Dr. Helms included, felt the service should be located in the UHF range.

On the whole, the petitioner was quite pleased with the public comments. The opposition comments can be addressed as part of my response to the submission made by council for The American Radio Relay League.

COMMENTS OF THE AMERICAN RADIO RELAY LEAGUE

The League attempts to make four principal points in their submission. They are:

1. The League denies that the public needs such a service. Their response states "(a) the Amateur Radio Service already provides for communications between computers using packet radio, therefore another radio

service is unnecessary;"

2. If the computer public wants access to the airwaves, they must earn an amateur radio license. The League states that "the Amateur Radio Service has the infrastructure and discipline needed for long-term viability of personal computer communications."

3. By means of an amateur radio license, the public will have access to the "orderly development of a data-communications network capable of handling the types and volumes of traffic which may be presented by the computer hobbyists;"

4. The 52-54 segment of the six meter amateur band is adequately populated. The contention of the petitioner, that this band is "underoccupied", is erroneous.

The League does not seem be totally convinced of the first three points. In fact, they state in their "ARRL Letter" dated 2 January; "It's not the proposal for the service that's the bone of contention, understand- it's just that Amateur Radio intends to go right on keeping that top two megahertz of six exclusively within the Amateur Radio realm".

These points will be examined and this response will show that the League's position is not in the public interest, convenience and necessity.

The Need(1)- The League contends that a PUBLIC DIGITAL RADIO SERVICE is unnecessary and denies that the general public wishes to communicate with their computers.

However, they destroy their credibility by stating; "Amateur packet radio operation is rapidly developing; it is extremely popular". They further state; "The League wishes to point out that there has been a remarkable growth in amateur packet radio over the past few years...". Finally, they provide statistics; "Packet radio in the Amateur Radio Service now stands at about 10,000 units in the field, in contrast to around 4,000 in early 1985".

The statements represent an interesting exercise in convoluted logic in view of their footnote statement; "the entire Petition is no more than an unsupported series of conclusory musings of the Petitioner. There is not one iota of ascertained need for either the proposed service or, therefore, for the allocation of spectrum therefor".

There is something illogical here! The League would have the reader believe there is no desire on the part of the public to have computer-to-computer communication. Then, upon earning an amateur radio license, the exchange of information via computers suddenly becomes viable and desirable!

As pointed out in the petition, there are no conclusive facts and figures available to prove that the public desires computer communications. Inadvertently, the League has proven the basic premise of the petition far more effectively than my "conclusory musings".

The Ham License(2)- The League contends that if an individual desires computer communications, they must have

an amateur radio license. According to the League only the Amateur Radio Service provides the "infrastructure and discipline needed for the viability of personal computer communications".

Where is it written that a ham license bestows discipline upon the holder? One need only listen to the 75 meter amateur band to refute this argument. A quick tour of two meters will reveal that good taste, manners and courtesy are not enclosed when one receives the envelope containing an amateur radio license. These things cannot be printed on paper any more than technical expertise can be obtained by studying to pass the Novice/Technician examination.

An amateur license is extremely easy to obtain thanks, in part, to the Commission Rules and Regulations. However, one must face the fact that some people have no desire to enter the wonderful world of amateur radio. It is arrogant to force people to become radio amateurs in order to achieve access to the airwaves. Why not insist that those who fly model airplanes, use Cellular telephones or open their garage doors also become licensed radio amateurs? It is basically dishonest to leverage the ranks of the amateur radio by force and, as a byproduct, increase League membership.

Amateur Packet Radio is Adequate(3)- The PUBLIC DIGITAL RADIO SYSTEM, as proposed, is not simply an adaption of the amateur packet radio system. While it is conceptually similar, the PUBLIC DIGITAL RADIO SERVICE features

significant improvements.

It is safe to say that the creators of the amateur packet radio concept never envisioned that it would become so popular so quickly. A growth from 4,000 to 10,000 units in the short space of 2 months is truly incredible.

Unfortunately, this dynamic growth has also revealed a flaw in the system. The data exchange rate is slow, even with a limited number of users. This appears to be a major complaint nationally among "packeteers".

Local systems slow down to an annoying point, when more than 8-10 users are on a given frequency. Some users "spin off" their activities and move to another frequency. The use of many channels makes the automatic delivery of messages extremely difficult. It becomes necessary to propagate the same information on many channels. This is not spectrum efficient.

The use of high-site packet repeaters has severely limited the number of simultaneous users. These elevated "digipeaters" can probably never be eliminated because of the relatively small number of radio amateurs using packet radio in a given area. The powerful high-site digital repeater provides communication over large areas but precludes any more than one user on a given frequency at any given time.

The solution, of course, is a network of very low power stations which directly communicate over very limited distances. Those in one area can communicate simultaneously

without interference to those in another area.

There is a second problem which is even more serious. This is the slow rate at which information is exchanged. Presently communications are conducted at 1200 baud (approximately 120 characters per second). As an inducement to become a radio amateur "packeteer", the League offers a digital Valhalla (at some future date) of 19,200 baud.

If the growth of the PUBLIC DIGITAL RADIO SERVICE parallels that of the amateur radio service, the network would soon be overloaded even at 19,200 baud. There is reason to believe that the growth would exceed that of amateur radio since no licensing would be involved. It is also likely that many radio amateurs would utilize the network, as indicated by the public comments. This provides a unique opportunity to introduce the public to other exciting areas of amateur radio.

As pointed out in the petition, it is essential that the popularity of the service be anticipated. Provision must be made for an adequate number of users from the outset. Designing the network for limited distance communication with high data rates will accomodate an unlimited number of users. Clearly, the amateur radio packet network does not qualify for either requirement.

Six Meter Activity(4)- Some confusion resulted from a typographical error in the third paragraph on page -9-. The sentence should read"....less than 1,000 are active on this portion of the six meter band". Even with this correction,

the League has shown that activity is probably higher than stated in the petition. The estimates were made by extrapolating sales of commercial equipment for this band. Overlooked were the numerous conversions of obsolete 30-50 MHz low-band FM two-way radios to operate on six meters.

However: a closer look at the six meter repeater list supplied by the League is interesting. Ten of the repeaters listed are in Canada. Further, only 24 of the 50 states have more than one repeater. In 20 states there are no repeaters. Clearly, the band is underutilized in these areas.

The repeater situation in the State of Washington is typical. According to the Western Washington Amateur Repeater Association, there are 60 repeaters on 2 meters, 26 on the 220 MHz band, 51 on the 432 MHz, yet there are only 9 active repeaters on 6 meters.

The repeaters generally consist of modified surplus low-band FM equipment. A minimum of financial hardship would result from moving repeater activities to another amateur band. It would also appear that repeater usage could be accommodated in the 50-52 MHz portion of the six meter band.

While the League has shown there is more activity than previously supposed, they have failed to prove that the 52-54 MHz portion of the six meter band is adequately utilized or why it should not be allocated to the PUBLIC DIGITAL RADIO SERVICE.

COMMENTS OF MST (MAXIMUM SERVICE TELECASTERS

The response from MST opens with a preconceived assertion. On the first page we learn of "the virtual certainty that Petitioner's proposal would cause significant new interference to television Channel 2". This notion is "proven" by impeccable mathematics, based on dubious assertions. The preordained conclusion is reached that "operation of these radio modems at one watt output power would cause perceptible levels of interference to television receivers within a 2.2 mile radius". This contention is preposterous.

At the outset, MST agrees with the petitioner that amateurs have avoided the 52-54 segment of the six meter band. This is done to support their position that signals in this region cause television interference. MST also mentions other sources of channel 2 interference, such as sporadic "E" reception, which have no bearing on the petition and which are beyond the control of the petitioner.

Conceding their response, MST joins forces with strange bedfellows to contradict themselves. Footnote 1 reads; "Further, as indicated by the Comments of the American Radio Relay League, filed this same date, the former belief is likewise unfounded" (my contention that the 52-54 MHz portion of the six meter band is underoccupied).

The ARRL contends there is considerable activity on the six meter band. Transmitters used by amateurs typically

vary from 10 watts to 1,000 watts. If one accepts the MST statement that a one watt transmitter on adjacent frequencies will cause interference within a radius of 2.2 miles, then one must logically conclude that radio amateurs cause even greater interference and over greater distances by virtue of their high power equipment. However, we know this is not the case and the assertions of MST are faulty.

It should be mentioned that transmitting equipment used by radio amateurs is not subject to FCC specifications. In particular, "home brew" and modified commercial equipment is seldom measured by the user for spectral purity of emissions.

A Short Course in TVI- Television interference results from two principal sources, i.e. (1) overload of the television receiver r.f. amplifier stage, which causes cross modulation and (2) emissions outside the authorized bandwidth which fall within a television channel.

Commission personnel can prove that a one-watt signal will not cause television interference, within the constraints mentioned in the petition. This can be simply demonstrated by operating a hand-held transceiver in the vicinity of various television receivers. Such a hand-held product may be difficult to find, however, due to the low volume demand for commercial six meter equipment. However, I understand SanTec makes such a transceiver.

The MST submission suggests that a wideband digital transmission will cause more interference than would be

generated by the hand-held test described in the previous paragraph. However, the petition states that all spurious emissions outside the 52-54 MHz band must be suppressed by approximately 60 db. Thus, it matters little whether the origin of the spurious is carrier, modulation, data bits or rock and roll music. 60 db of suppression is still 60 db.

Note that video information is also wideband and the radiated spectrum resembles a high speed data transmission. Yet television signals coexist side-by-side without mutual interference as proven by thousands of cable television systems.

If the Commission is not comfortable with 60 db, make the specification 70, or even 80, db. While this makes the design of the equipment more difficult, it can be done. Further, the equipment cost will still be less than for UHF equipment with a more relaxed specification.

MST "clutches at straws" throughout the response. They state "modem operators, particularly in rural area, might find it necessary to boost their operating power to well above one watt in order to reach the nearest transceiver". MST assumes that if a law is passed it will be broken, therefore don't pass the law. They also mention large antennas, man made noise, and so on to support their contention that the service should be at some higher frequency.

Other respondents have made the same suggestion but they do not provide the Commission with any suggestions or

guidance as to where this "promised land" might be. The attitude is "they seem like nice folks, I just don't want them living in my neighborhood".

Conclusion- The purpose of my petition was to point out the need for computer-to-computer communications for the public, present certain minimal specifications and identify spectrum space where it could be accomodated.

I had naively hoped that a way could be found to provide for this need within the Amateur Radio Service, as suggested on page 21 of the petition. The League, however, has driven a stake through the heart of this codeless vampire for once and for all.

I believe the Commission recognizes there is a need for the PUBLIC DIGITAL RADIO SERVICE. The implementation of the concept is far more important than the location of the PUBLIC DIGITAL RADIO SERVICE within the radio spectrum. Technically, it can be located anywhere within the spectrum up to 1 GHz, or so. While equipment costs would be higher at these frequencies, this would not significantly retard the growth of the service in the long term.

If the 52-54 MHz portion of the band is not suitable, where can the service be located? Above the frequencies of concern to MST is the sacred ground of the Cellular Service.

Further up is the new 902 MHz amateur band. The PUBLIC DIGITAL RADIO SERVICE could easily be accomodated in the 922-928 portion of this band. This is above the proposed repeater frequencies, does not involve international

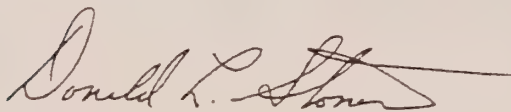
treaties and television interference would be nonexistent.

Above this band, the satellite industry can be expected to protest another incursion. As we continue to "move to the back of the bus", communication by light beam seems the only answer.

I hope it is not and the Commission can identify a small segment of spectrum where the PUBLIC DIGITAL RADIO SERVICE can be located.

In closing, the writer would like to thank the Commission for the opportunity to respond to the negative comments on RM-5241.

Sincerely,

A handwritten signature in dark ink, appearing to read "Donald L. Stoner". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

Donald L. Stoner

6014 E. Mercer Way

Mercer Island, Wa. 98040

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Before the
FEDERAL COMMUNICATIONS COMMISSION FEB 28 1986
Washington, D.C. 20554

FCC
Office of the Secretary

In the Matter of)	
)	
Amendment of Part 97 of)	PR Docket No. 85-105
the Commission's Rules to)	
Permit Automatic Control of)	
Amateur Radio Stations)	

To: The Commission

PETITION FOR EXTRAORDINARY RELIEF

The American Radio Relay League, Incorporated (the "League") hereby respectfully requests that, until final Commission action is taken on the League's Petition for Partial Reconsideration filed in this proceeding February 24, 1986, the Commission rescind its prohibition on transmission of third-party traffic by amateur stations under automatic control on frequencies above 50 MHz, under certain circumstances. As good cause for this request,^{1/} the League states as follows:

1. On January 16, 1986, the Commission released a Report and Order in this proceeding, FCC 86-18, 51 Fed. Reg. 3069, which amended various sections of Part 97 of the Rules. Said amendments, effective March 14, 1986, permit automatic control of digital communications above 50 MHz in the Amateur Radio Service,

^{1/} The request is in the nature of a request for partial stay pursuant to §1.429(k) of the Rules.

as per the League's request in RM-4829. However, the Report and Order also established an absolute prohibition on the transmission of third-party traffic by amateur stations while operated under automatic control. This prohibition threatens to undermine the efforts of more than 14,000 radio amateurs to take the initial steps toward establishment of an amateur packet radio network for the rapid and accurate relaying of messages and other data. The League has been informed by Commission staff that some nineteen Petitions for Reconsideration (including that of the League) have been filed in this proceeding, and that a considerable period of time will be required for the processing thereof even if the matter is accorded priority attention.

2. In the meantime, the new language prohibiting third-party traffic transmitted by amateur stations under automatic control, if permitted to take effect on March 14, 1986, will have a chilling effect^{2/} on the development of packet radio by amateurs. The effect of the prohibition has caused sufficient concern among amateurs that some small businesses serving the amateur radio community may be placed in serious financial jeopardy. Accordingly, the League now requests that the Commission temporarily lift the prohibition on third-party traffic

^{2/} Such effect has already been obvious, even before the effective date of the Report and Order, inasmuch as the same characterized the prohibition as the application of an existing rule. But see ¶3, infra.

being transmitted by stations under automatic control on frequencies above 50 MHz. The following limitations are suggested, in the interest of minimizing the possibility of abuse.

- (A) The relief requested herein would apply only to amateur stations using digital communications above 50 MHz, and only to the retransmission of third-party messages originated by another amateur station not under automatic control;
- (B) To ensure the widest possible monitoring capability of messages sent as the result of grant of this Petition, relief is requested only for packet radio transmission using, or compatible with, the AX.25 protocol; and
- (C) The lifting of the prohibition shall apply only during the pendency of the reconsideration proceeding.

3. While the Report and Order stated that the prohibition of third-party traffic transmission by amateur stations under automatic control was not a new restriction, the practical effect is to introduce a new restriction because the previous policy had been articulated only with regard to autopatch operation by repeater stations^{3/} and not specifically applied to digital communications. Despite the widespread use of VHF packet radio stations to relay messages, operating under the rules applicable to repeaters, no statement by the Commission nor enforcement

^{3/} See FCC 78-742; 70 FCC 2d 1303 (1978).

action or threat of such action, has ever been aimed at curbing the practice. Indeed, such would have been inconsistent with the Commission's long-espoused support of the development of packet radio as an effective public-service and disaster communications tool.

4. No harm can result from grant of the relief sought herein, inasmuch as a licensed operator will be required in order to introduce any message into the network before it can be re-transmitted automatically. Further, thousands of amateurs can and will be monitoring (albeit not necessarily in real time) with equipment capable of receiving, recording in memory, and displaying any communication conducted pursuant to authority granted hereunder.

THEREFORE, good cause having been stated for the extraordinary relief requested, the American Radio Relay League, Incorporated respectfully requests that, until a final Order is entered resolving the issues raised in the League's February 24 Petition for Partial Reconsideration in this proceeding, the Commission waive, suspend, or hold in abeyance the prohibition of third-party message traffic transmitted by amateur stations while

under automatic control, when such stations are operated under the limited conditions set forth hereinabove.

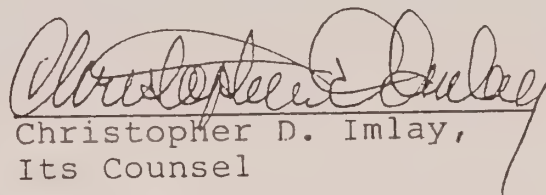
Respectfully submitted,

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THE AMERICAN RADIO RELAY
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By:


Christopher D. Imlay,
Its Counsel

February 28, 1986

FILE COPY

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

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FEB 24 1986

In the Matter of

Amendment of Part 97 of
the Commission's Rules to
Permit Automatic Control of
Amateur Radio Stations

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FCC
Office of the Secretary

PR Docket No. 85-105

RM-4879

To: The Commission

PETITION FOR PARTIAL RECONSIDERATION

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On behalf of The American
Radio Relay League, Inc.

February 24, 1986

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SUMMARY

The American Radio Relay League, Incorporated seeks Commission reconsideration of that portion of the Report and Order, FCC 86-18, which precludes operation of amateur radio stations under automatic control while transmitting third-party traffic. This provision is an exception to the general grant of authority in the Report and Order permitting automatic control of amateur digital communications above 50 MHz.

The third-party traffic exception requires manual control of such stations whenever transmitting third-party traffic, thus in effect nullifying any possibility of automatic control of amateur packet repeaters (digipeaters) or computer-based message systems (CBMSs). This is because there is no sure way of discerning whether the messages are the thoughts of the transmitting station or of some third party in the case of the digipeater. CBMS operation, by definition an automatic message storage and forwarding system, would have to be under manual control at all times, as it contains messages originated by third parties.

The International Radio Regulations (Geneva 1979) do not prohibit automatic control in these instances.

Present amateur digital technology makes it impractical as well as unnecessary, to require a control operator at each relay point of the communications. Rather, the potential for abuse, as well as the only real point of application of the control requirement, is at the point of origin of the communication.

The useless application of this control operator requirement adds no protection against misuse of amateur frequencies by unsupervised, unlicensed individuals, but is rather an example of technology having outpaced regulation. The latter should not frustrate or impede development of public service applications of amateur packet technology.

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of)
)
Amendment of Part 97 of) PR Docket No. 85-105
the Commission's Rules to)
Permit Automatic Control of) RM-4879
Amateur Radio Stations)

To: The Commission

PETITION FOR PARTIAL RECONSIDERATION

The American Radio Relay League, Incorporated (the "League"), the national association of amateur radio operators licensed by the Commission, hereby respectfully requests that the Commission reconsider and reverse that part of its Report and Order, FCC 86-18, 51 Fed. Reg. 3069, released January 16, 1986 (the "Report and Order"), which stipulates that "no amateur station may be operated under automatic control while transmitting third-party traffic." As support for this request, the League states as follows:

1. The Report and Order was issued following receipt of comments in response to a Notice of Proposed Rule Making (50 Fed. Reg. 15196, released April 17, 1985), which in turn was the result of the League's Petition (RM-4879) requesting automatic control of amateur digital communications. The Notice of Proposed Rule Making was an expansion of the League's proposal to the extent that the latter sought only automatic control of

digital communications while the former proposed to permit automatic control of all amateur communications above 29.5 MHz. The Report and Order adopted only the League's proposal to permit automatic control of amateur digital communications on frequencies above 50 MHz.^{1/} However, it also held that "... we affirm our present rule that requires the control operator to be present at the control point whenever the station is engaging in third-party traffic" (Report and Order, Paragraph 8).

2. The League appreciates the Commission's grant of permission for automatic operation of digital communications above 50 MHz, in response to the League's petition. However, the Commission's interjection of manual control of stations whenever transmitting third-party traffic, if sustained, will have serious negative impact on the development of packet radio and amateur radio public service communications, particularly readiness for emergencies.

3. The development of packet radio is hobbled by the Report and Order in several respects. Chief among them is that the operators of packet repeaters (digipeaters) or computer-based message systems (CBMSs) must, somehow, prevent the transmission of third-party communications except when a control operator is

^{1/} There are no amateur frequencies between 30 and 50 MHz, hence the specification of the latter as a lower frequency range.

present. Automatic operation, while colorably authorized by the Report and Order, is not legally safe for fear that some other station may send third-party traffic through the digipeater or CBMS at any time. When a digital communication station is under automatic control, there is no sure way of discerning whether the messages are the thoughts of the transmitting station or those of some third party. Thus, the Commission has granted automatic control of digital communications above 50 MHz on one hand while adding third-party language that practically prohibits automatic control on the other. It is a classic "Catch-22" situation.

4. Rules that permit automatic operation except when transmitting third-party traffic and require a control operator to be present when transmitting third-party traffic will inevitably force amateur radio operators to take one of two courses: (a) turn the digipeater or CBMS on only when under operator control and do not use automatic control at any time, or (b) leave it on all the time under automatic control and hope that no one sends third-party traffic through it, or if such traffic is sent, that an FCC Monitoring Station does not issue a notice of violation. Neither of these alternatives appears to be acceptable. If (a) prevails, there will be so few digital communications stations on the air that amateur radio and the public it serves will have lost the allure of an automatic packet-radio network capable of providing almost instantaneous 24-hour-a-day communication anywhere in the nation. If (b) predominates, a wedge will have been driven between the Commission's rules and

the heretofore splendid record of compliance by licensed radio amateurs. We dismiss, as impracticable, the theoretical third course that a station may use automatic control whenever no third-party traffic is being transmitted and manual control when third-party traffic is to be sent. That course would require that an operator be present at a control point at all times during "automatic operation" simply to know when the control operator must be present to oversee the handling of third-party traffic; an absurdity.

5. There are technical differences between digipeaters and CBMSs. The new rules contained in the Report and Order would further set them apart because of the third-party control requirements. The technical difference is that a digipeater receives, then transmits, a message in near real time (perhaps one-half second), while a CBMS receives, then stores, and may retransmit a message when called by another station or may do so automatically to forward the message to its intended destination. The new rules in the Report and Order would have the following effects:

(a) A digipeater could be automatically controlled when it is simply facilitating communication by repeating between two amateurs who cannot communicate directly, but would have to be manually controlled when transmitting third-party traffic.

(b) A CBMS (by its nature, an automatic message storage and forwarding system) would have to be under manual operation at all times because it will contain, and may transmit, messages originated by third parties, i.e., persons other than the CBMS control

operator or the other station with which the CBMS station is in communication.

Accordingly, the new rules regarding control of third-party communications would render the digipeater of doubtful utility and the CBMS of practically no use. Yet, in a technical sense, the two differ only in whether or not they store before forwarding.

6. There exists in the rules a tortuous combination of a definition of "third-party traffic" and associated control requirements. One could conclude that they are self-contradictory. Section 97.3 defines third-party traffic as:

Amateur radio communication by or under the supervision of the control operator at any amateur radio station to another amateur radio station on behalf of anyone other than the control operator.

The International Radio Regulations (Geneva, 1979), Article 32, number 2733 and 2734 simply state:

(2) It is absolutely forbidden for amateur stations to be used for transmitting international communications on behalf of third parties.

(3) The preceding provisions may be modified by special arrangements between the administrations of the countries concerned.

It is interesting to note that the Radio Regulations offer no definition of "third-party" communications and concern only the transmission of international communication on behalf of third parties. Conspicuous by its absence is any reference to the "control operator," in the Radio Regulations.

7. Neither the Commission's rules nor the Radio Regulations specify the limits of the definition of "third party." If

one interprets literally the definition of "third party" given in Section 97.3 of the Commission's rules, then a "third party" is "anyone other than the control operator" of the two stations in direct radio contact. In a voice repeater operation, there are typically three stations involved: The Section 97.3 definition would appear to say, on its face, that a repeater would always be in third-party communication merely by virtue of the involvement of three stations (control operators or parties) in the communication. Yet, the Commission's rules explicitly permit automatic control for repeater operation under Section 97.85. It may be inferred that the typical repeater communication, involving two amateurs talking-together via a repeater, does not constitute "third-party" communication even though it involves three parties. If an acceptable interpretation is that the three-station example does not necessarily involve third-party communication, it then leaves open the questions of whether (a) the number of repeaters, if more than one, or (b) a variable time delay in the repeating process, changes the nature of the process. It would seem from the abovementioned apparent contradiction in the rules that the Commission's intent was to exclude amateur-to-amateur communications (no relay, one relay or several relays; real time, near real time, or delayed) from the effective definition of "third-party" communication. This exclusion would leave the intended definition of "third party" as "a person other than a licensed radio amateur who originates communications, written, oral or otherwise, for transmission via amateur radio."

The Commission's rules do not say that, however; instead the rules are problematic and subject to widely disparate interpretation in this regard.^{2/}

8. The rules changes contained in the Appendix to the Report and Order would make explicit in the text of the rules what was heretofore implicit and subject to interpretation, that automatic control not be used whenever transmitting third-party traffic. This stipulation would apply not only to digital communication but would be applicable to beacon operation, repeater operation and auxiliary operation. In beacon operation, because of its nature, there would be little or no third-party communication. Repeater operation and auxiliary operation would be hampered by the same problems outlined earlier for digital communication. Operators of repeaters and auxiliary links, according to the new rules, should be loath to use automatic control for fear that someone may send third-party communication

^{2/} The Report and Order is not helpful in this regard. It slavishly adheres to the verbatim definition of "third party traffic" in Section 97.3(v) of the rules. It stated (at Paragraph 4) that:

Many of the commenters request that high-speed digital operating modes, such as packet switching, bulletin boards, computer-based message systems and electronic mailboxes be exempt from the requirement that the control operator supervise third party traffic.

Actually, what was sought primarily was exemption of intermediate relay stations in digipeater and CBMSSs, not exemption of the originating station. The only rationale stated in the Report and Order for denying the same was that it "would be inconsistent with other types of amateur operation."

(which still lacks a clear definition) through them while the control operator is not present at the control point. Of interest is the similarity of control of a network in auxiliary operation and a digital-communication network. In the case of the auxiliary network, the control operator issues the command and subsequent relays in the network automatically perform their functions as commanded. In digital-communication networks, the commands issued by the originating station (in the form of call requests, explicit routing instructions, or other supervisory information contained in the packet header) cause subsequent relays in the network to perform as commanded.

9. While considering the limiting elements of the third-party traffic control operator requirements, one wonders what the effect of the same will be on linear translators, used at VHF in certain parts of the country, and on amateur satellite operation. While there is no specific provision for automatic control of linear translators or satellites, is a control operator of these relay devices required to monitor the entire passband of each device at all times in case third-party traffic is transmitted through the device on some frequency within the passband? As it is impossible as a matter of actual practice to monitor the entire passband simultaneously, are satellite licensees and linear translator licensees in violation of present control operator requirements?

10. Although the prohibition of automatic control when transmitting third-party traffic would apply equally to all types

of operation where automatic control is at times permitted, there are profound differences in the practicality, apart from the desirability, of the exercise of control. In every case under automatic control, it is impractical for the control operator to know whether or not third-party traffic is being transmitted through the station because, quite properly, the Commission's rules do not require a control operator to be present at a control point when the station is under automatic control:^{3/}

(a) In the case of the more-familiar voice repeater operation, however, it is possible for the control operator to simply keep "half an ear open" for the activity on a voice repeater by keeping a receiver on at low volume at home, at work or in the car. Effective control of a voice repeater can be effected shortly after a third-party communication is transmitted--as quickly as it takes to get to the remote control equipment (a telephone if by wire or via auxiliary radio

^{3/} As the League's Comments in this proceeding noted, a potential for abuse by unlicensed individuals in a digital amateur radio system exists only at the point where the third-party traffic is originated and introduced into the amateur radio medium. It is at this point and only at this point that the control operator should be required.

equipment operating above 220.5 MHz.) In the case of a voice repeater, there is only one conversation going on at any time, the language is well understood by the control operator, and the speed of communication is that of normal speech (a maximum of about 300 words per minute [WPM]). For those periods when the control operator is not present at the control point, the control operator's habit of keeping half an ear open supplemented by being alerted by others who are doing the same thing adds up to effective control of a voice repeater.

(b) In the case of digital communication, it is meaningless to simply "keep an ear open" for a digipeater or CBMS to "hear" whether or not third-party traffic is being transmitted. It requires a video display terminal (VDT) or a printer to make the communication visible to the control operator. Above 50 MHz, there are no amateur packet-radio circuits in the United States that operate at speeds less than 1200 bits per second, which translates to about 1440 WPM. The average person cannot read faster than

about 300 WPM. Because of the speeds involved, it is not practical to even "keep an eye open" for third-party traffic passing through a digipeater or CBMS because even the control operator's full time and attention (a 300-WPM reading speed) would be insufficient to read all the traffic. To be in full compliance with the Commission's rules, a control operator would have to not only give full time and attention to monitoring the digipeater or CBMS, but would have to slow the network down to his or her reading speed. The Commission's rules permit speeds of 19,600 bauds (equivalent to at least 23,520 WPM) between 50 and 220 MHz. This speed restriction comes at a time when amateur packet-radio operators have come to a conclusion that 1200 bauds is too slow for efficient operation and are phasing in 9600-baud operation. Even that speed will be too slow to handle network requirements by 1987, when an upgrade of intercity trunks to 56,000 bauds is desirable. Paragraph 4 of the Report and Order seems to dismiss speed as a

consideration.^{4/} However, to dismiss the higher speeds in this perfunctory manner is to reduce digital communication in the Amateur Radio Service from a resource of great potential public service to the status of a mere toy.

11. Another issue raised is how fast a control operator is obliged to intervene after detecting an improper third-party

^{4/} To the extent, however, that speed of digital communication creates a lack of "monitorability" by a control operator of a relay station, the need for the control operator diminishes. The Commission has held that lack of ability to decipher communications "in transit" should not be an obstacle to the development of new technology in the Amateur Radio Service. In authorizing unspecified digital codes, the use of which could inhibit the Commission's ability to monitor coded transmissions for content as well as the ability of the amateur community to monitor transmissions for purposes of self-enforcement, the Commission held that:

In balancing our objectives of encouraging new technologies against assuring our enforcement capability, it must be recognized that there is an incompatibility between authorizing experimentation with "exotic" technologies and the employment of channel monitoring as an enforcement tool. Our ability to verify that the content of messages complies with our rule requirements will be hindered by the broad relaxation of regulatory constraints that we are ordering in this proceeding. However, the Commission finds itself in agreement with the ARRL that special provisions we are including in the final rules, . . . combined with the zealous effort of the amateur community to protect their allocated frequency bands, provide adequate protection against unauthorized operation in the service. (See Report and Order, FCC 82-413, released September 21, 1982.)

The situation with automatic control of digipeaters and CBMSs provides a far greater ability to safeguard against unsupervised third-party use of the network. See Paragraph 15 hereinbelow.

communication such as commercial traffic. It is not purely academic, as packet-radio operators must know their obligations under the rules. This question surfaces after careful examination of the differences between voice and digital communication. In voice repeaters, it must be recognized that the automatic push-to-talk circuitry of the repeater is such that two stations could engage in third-party communication so brief that the control operator could intervene only after the fact. It is not the practice for the control operator to first receive the third-party message, decide whether or not it is permitted, then retransmit it. In other words, there is no a priori censorship. If the third-party traffic is automatically repeated and is judged to be improper by the control operator, it is the usual practice for the control operator to issue a warning to the offender(s). In packet radio, amateur radio practice (i.e., no a priori censorship; issue warnings afterwards) has been essentially the same. There is a difference between the improper transmission and the issuance of the warning, however. In voice-repeater operation, the warning is issued within a few seconds after the occurrence or not at all (if missed by the control operator). There is usually no magnetic tape record to audit after the fact. In packet radio, the elapsed time between an improper transmission and the warning may be from a few minutes to perhaps as long as a day. However, there is normally a record of the message and logging information on magnetic disk of a CBMS. It will be a necessity for amateurs to continue such

records in the further development of a packet-radio network for network-management and troubleshooting reasons alone. These records will be valuable in preventing use of the network by interlopers.

12. The crippling third-party control requirements have been interjected at a time when packet radio has seen phenomenal growth from around 4,000 stations a year ago to approximately 14,000 stations now. Part of its appeal, no doubt, can be assigned to its technical novelty as a fast method of transmitting written communications directly between two amateur stations. Also part of its present attraction is the automatic near-real-time repeating or store-and-forward transfer of messages through up to 8 digipeaters and CBMSs. Yet these digipeater and CBMS facilities represent only the very beginning of what amateurs envisage as an amateur packet-radio network. Such a network will involve "packet switching," a technique specifically included by the Commission when it first permitted ASCII in the Amateur Radio Service at the conclusion of Docket 20777 and presently permitted at Section 97.69 of the Commission's rules. The language of the Third Report and Order in Docket 20777 and numerous conversations with FCC staff at that time made it clear that the Commission and staff fully intended to permit and encourage packet switching. Subsequent rule changes are in conflict with that intent, namely:

(a) the third-party control provisions
of the Report and Order in this proceeding,
discussed above, and

(b) amendment of the emission designators in the Third Report and Order of General Docket 80-739, which omitted the proper emission designators for packet radio, not to mention other popular modes used in the Amateur Radio Service.^{5/}

13. In recent discussions, Commission staff have indicated to League representatives that it is not the Commission's intent nor desire to frustrate or impede the development of the amateur packet-radio network. Yet the Report and Order in the instant proceeding will have a devastating effect on current packet-radio operations and will inhibit further growth, inevitably relegating packet radio to the status of stillborn technology. There is no doubt that the Report and Order has already had just such an effect in the amateur packet-radio community. Some amateurs have responded defensively by seeking advice from others which in some cases has been dispensed without full possession of the facts involving the regulatory history of automatic operation, third-party traffic and digital communication in the Amateur Radio Service. Others, more defensively, have turned off their VHF digipeaters and CBMSs for fear that they may inadvertently transmit third-party traffic under automatic operation. The

^{5/} The incompleteness of the emission designators was noted in League Comments filed in PR Docket 85-23, but the errors were never corrected in that proceeding or to this day. Suffice it to say that the FCC staff was informally made aware of the incompleteness of the emission designators within a few days of the release of the Third Report and Order of General Docket 80-739. Accordingly, the Commission will be asked again formally to correct the present table of emission designators.

instant Report and Order has stalled the job of building an amateur packet-radio network. The amateur who epitomizes the kind of high-technology experimenter sought by Section 97.1(b) of the rules is demoralized by the outcome of this proceeding.

14. It is the League's understanding through discussions with Commission staff that the Commission's main concern is to prevent unlicensed persons from unsupervised access to amateur radio or an amateur radio network. The League shares this concern and will staunchly defend against such unsupervised access. It is also undoubtedly the Commission's intent to encourage amateur contributions to the advancement of the radio art in general, and development of a packet-switched network in particular, and not to frustrate or impede its development. It is possible, however, to permit true automatic control throughout a packet-radio network while simultaneously providing safeguards against unsupervised third-party use of the network.

15. The key to achieving the aforementioned goal is in the control of the introduction of third-party traffic, not its subsequent repeated automatic relays throughout the network. This view was offered in the League's Comments dated June 26, 1985, and considered, but not heeded, by the Commission in preparation of the Report and Order in this proceeding. Controlling the introduction, rather than relay, of third-party communications is pivotal to the functioning of a packet-radio network. Amateurs can effectively exclude improper third-party communications from the amateur radio network by controlling its

introduction and, realistically, only at that stage. All written messages prepared under the ARRL message format have a serial number assigned by the station of origin as well as the call sign of the station of origin. It not only takes a deliberate act on the part of the control operator at the station of origin to introduce the message into the network, but there is a "trail of accountability" throughout the transmission and storage life of the message by virtue of the serial number and station of origin in the message heading. If the message transits packet-radio CBMSs operating with current software, the verbatim record of the message exists on magnetic medium, along with a capability of producing detailed logs of the message transfers and a history of who accessed them.

16. It adds no protective value to amateur radio, to the network, or to the public to have each third-party communication personally checked and re-released by the control operator at every transit point along its journey through the network. Rather, as discussed above, such a requirement would greatly impede, and perhaps block, traffic through the network (assuming that amateurs would decide to build the network under such circumstances). No communication network could possibly be considered efficient and effective if every communicator at every relay station along the route must read, then decide whether or not to veto each message handled by that station. In fact, such a criticism of the ARRL National Traffic System has already been levied by the National Communications System in connection with

exercise "Night Tango" as the result of an amateur thinking that a post-nuclear attack drill message was improper. In most communications networks, individual stations have no authority to veto messages but are obliged to pass them on to their destination. Furthermore, a relay station is usually not able to judge the propriety of a context of, for example, an emergency situation. It is obvious that a Red Cross message ordering batteries may or may not be proper depending upon whether or not an emergency exists in the area where needed.

17. It is not often practical for a digital-communication relay point to judge the propriety, or even always recognize, a transmission on behalf of a third party. In packet radio, a message is broken up into packets, usually one line of text long. In isolation, a single packet may be meaningless as it is viewed out of context. Depending upon the networking protocol eventually adopted for amateur packet radio, all packets constituting a message may not necessarily transit the same switches, as it is possible for each packet to be dynamically routed under a datagram type of networking protocol. The only points in a datagram network where the entire message may be seen is at the station of origin, the destination, and any switching nodes around which there are no alternative routes. Except at the station of origin, the packets need not be in the order originated. Thus, the reality of present-day amateur digital technology is that only at the point of origin can a control operator requirement be properly applied.

'18. The question of risk vs. benefit in considering manual control throughout an amateur packet-radio network while handling third-party traffic should be resolved in favor of the benefit of the efficient functioning of the network. In the opinion of the League, the widespread public benefit of having a high-speed packet-radio network with the capacity of handling major emergencies far outweighs the narrow risk of unsupervised use of the network by unlicensed persons.^{6/} In fact, the risks are finite and controllable by supervising the introduction of third-party communications. Improperly supervised introduction of third-party communications by a station of origin (whether licensed or unlicensed) would be detected in adequate time to curtail further abuses by that station. Improper communications would be detected by other packet-radio stations monitoring the traffic on a digipeater or CBMS frequency, and by the control operator of a CBMS when scanning messages stored and printing out logs of access and message-transmission activity. Higher-level packet switches and message-storage-and-retrieval systems to come will inevitably make even greater use of sophisticated logging procedures, which will be essential to proper overall network management. Requiring that the amateur packet-radio network

^{6/} The Commission in the past has been willing to permit that minimal risk in order to foster use and development of new technology. It has done exactly the opposite in this proceeding. See Footnote 4 hereinabove.

manually control each relay stations when transmitting third-party traffic would only slightly reduce the risk while sacrificing the far-greater benefit.

19. It is clear that technology has overtaken some aspects of Part 97 of the Commissions rules, particularly in regard to automatic control. An information explosion has taken place, and amateur radio cannot continue to function as though it had not. The rules can and should be amended in a way that will harmonize the need to keep up with the information speed and volume yet protect against unsupervised third-party intrusion into the amateur radio network. Unnecessary regulatory underbrush has thus far choked out amateur technological advancement.

THEREFORE, the Commission should reconsider and revise its rules in accordance with the attached Appendix and thus modify the Report and Order in this proceeding.

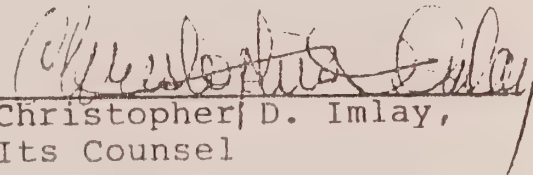
Respectfully submitted,

225 Main Street
Newington, CT 06111

THE AMERICAN RADIO RELAY
LEAGUE, INCORPORATED

Booth, Freret & Imlay
1920 N Street, N.W., Suite 520
Washington, D.C. 20036
(202) 296-9100

By:


Christopher D. Imlay,
Its Counsel

February 24, 1986

APPENDIX

Part 97 of Chapter I of Title 47 of the Code of Federal Regulations is amended, as follows:

1. The authority citation for Part 97 continues to read as follows:

Authority citation: 48 Stat. 1066, 1082, as amended; 47 U.S.C. 154, 303.

2. Section 97.3 (m) (3) is amended to read:

§97.3 Definitions.

* * * * *

(m) * * *

(1) * * *

(2) * * *

(3) Automatic control means the use of devices and procedures for control without the control operator being present at the control point when the station is transmitting.

3. Section 97.79 (b) is amended to read as follows:

§97.79 Control operator requirements.

(b) Every amateur radio station, when transmitting, must have a control operator. The control operator must be present at the control point of the station when the station is transmitting, except when the station is transmitting under automatic control. The control operator must be a licensed amateur radio operator or permittee designated by the station licensee. The control operator and the station licensee are both responsible for the proper operation of the station. For purposes of enforcement of the rules of this part, the FCC will presume that the station licensee is the control operator of the station, unless documentation to the contrary exists.

4. Section 97.69 is amended by adding a new paragraph (d), as follows:

§97.69 Digital communications.

* * * * *

(d) An amateur station may be under automatic control when transmitting digital communications on frequencies 50 MHz and above.

5. A new section 97.80 is added, as follows:

§97.80 Operation under automatic control.

(a) When under automatic control, devices must be installed and procedures must be implemented which will ensure compliance with the rules when the control operator is not present at the control point of the amateur station.

(b) No amateur station may be operated under automatic control while originating third-party traffic.

(c) Automatic control of an amateur station must cease upon notification by the Engineer-in-Charge of a Commission field office that the station is transmitting improperly or causing harmful interference to other stations. Automatic operation must not be resumed without prior approval of the Engineer-in-Charge.

amateur radio NEWS

The American Radio Relay League, Inc.

Newington, Connecticut 06111

February 25, 1986

FOR IMMEDIATE RELEASE

For more information contact:
Perry Williams, W1UED
American Radio Relay League
Newington, CT 06111
203-666-1541

ARRL Petitions FCC for Reconsideration of Third-Party Control

Newington, Connecticut, February 25--The American Radio Relay League petitioned the Federal Communications Commission, yesterday, to reconsider its Report and Order on PR Docket 85-105 because of the detrimental consequences of its provisions concerning control while transmitting third-party communications. That Report and Order granted permission for amateur radio operators to operate digital communications under automatic control above 50 MHz. However, it mandated manual control whenever third-party traffic is transmitted for all Amateur Radio transmissions where automatic control is allowed: digital communications, voice repeaters, auxiliary links, and linear translators. This petition was prompted by the ARRL Board of Directors who unanimously directed ARRL President Larry E. Price, W4RA, to "take such actions as may be necessary and appropriate to cause FCC Docket 85-105 to be amended to correct its restrictive and crippling effect on the development of packet radio and packet-radio communications..."

In its Petition for Reconsideration, the League asserted that the FCC would require a control operator present at the control point of an automatically controlled station at all times simply to determine if a control operator must be present. It was described as a classical "Catch-22." The League reiterated its earlier Reply Comments that packet-radio links above 50 MHz operate at a minimum 1200 bits per seconds--1440 words per minute. An average 300-WPM reader couldn't even read all the traffic flying past at 1440 WPM and higher, much less accurately recognize third-party traffic. Furthermore, the League let the FCC know of the chilling effect on high-technology experimenters who are building the Amateur packet-radio network.

The League acknowledged the FCC staff's stated intent to keep "hackers" and commercial interests out of the amateur packet-radio, not to frustrate or impede the development of the network.

The corrective measure recommended by the League was to require the presence of a control operator only when "originating" a third-party communication and not for each subsequent relay throughout the network.

The League was joined by several Amateur Radio organizations and individuals in filing for reconsideration of the PR Docket 85-105 Report and Order which would become effective March 14, 1986 if not amended.



THE AMERICAN RADIO RELAY LEAGUE, INC.

INTERNATIONAL SECRETARIAT OF THE INTERNATIONAL AMATEUR RADIO UNION

ADMINISTRATIVE HEADQUARTERS NEWINGTON, CONNECTICUT, U. S. A. 06111

LARRY E. PRICE
W4RA, PRESIDENT

LEONARD M. NATHANSON
WB4K, FIRST VICE PRESIDENT

GARFIELD A. ANDERSON
K0GA, VICE PRESIDENT

JAY A. HOLLADAY
W6EJJ, VICE PRESIDENT

RICHARD L. BALDWIN
W1RU, VICE PRESIDENT
INTERNATIONAL AFFAIRS

DAVID SUMNER
K1ZZ, EXECUTIVE VICE PRESIDENT

PERRY WILLIAMS
W1UED, SECRETARY

JAMES E. McCOBB
K1LLU, TREASURER

203-666-1541

QST

OFFICIAL JOURNAL

February 14, 1986

To : Ad Hoc Committee on Amateur Radio Digital Communication
From : Chairman
Subject: Status of FCC PR Docket No. 85-105

1. A number of you have written or telephoned your concerns over recent FCC actions that impinge on amateur packet radio. In this letter, I'll try to bring you up-to-date on what has happened and at least the near-term prospects.

2. The telephone call reportedly made by the FCC's Belfast (ME) Monitoring Station to the residence of James E. Scalf, K4TKU, Miami, FL, (in which it was alleged that he was away on a trip and thus not in control of his HF packet bulletin board) has ricocheted around the packet-radio community. I am sure you realize that unattended operation of packet or other Amateur Radio stations has never been, and is still not, permitted on HF in the FCC rules. A number of us believe that automatic HF packet operation would be a good thing and should be sought--eventually--with the right safeguards. The likelihood of our getting permission to do so will, in part, depend on our track record of compliance with existing rules and noninterference with other users of the crowded HF spectrum. So, incidents such as that allegedly involving K4TKU, besides sending a chill through the packet community, do not enhance our credibility with the FCC. So, our advice to operators is operate your HF packet station only when a control operator is present at the control point.

3. PR Docket No. 85-105 is another matter. The Report and Order, which you have all seen, appears to remove all ambiguity that may have existed concerning transmission of third-party traffic through stations operating under automatic control, either digital or otherwise. Such operation would clearly be prohibited effective March 14. Discussions between the League and FCC staff have affirmed that it is not the Commission's intent nor desire to frustrate or impede the development of the packet-radio network. But, there does appear to be a concern about the potential for exploitation of the network by nonamateur interests. At its January, 1986 meeting, the ARRL Board instructed the President of the League to "take such actions as may be necessary and appropriate to cause FCC Docket 85-105 to be

amended to correct its restrictive and crippling effect on the development of packet radio and packet-radio emergency communications caused by requirements for the control operator to be present at domestic intermediary relay points for transmission of third-party traffic." The objective is clear and is one to which the League has attached the highest possible priority. The strategy for proceeding will be developed and implemented in the next ten days--February 24 being the deadling for filing petitions for reconsideration. There is no need for packet operators to change anything they're doing above 50 MHz prior to March 14. Please do not read into our mentioning of March 14 as something that is inevitable, as we hope to get clarification of the third-party question before then.

4. President Price and Executive Vice President Sumner have scheduled appointments with FCC Commissioners and staff on February 27 to discuss our concerns.

5. Of course, it is the privilege of any amateur or amateur group to write to the FCC concerning Docket 85-105 or to file a formal Request for Reconsideration. But before doing so, we suggest a thorough understanding of the issues so as not to inadvertently cause the situation to be even further confused. Please ask anyone who plans to write to the Commission on this matter to drop a copy to Perry Williams, W1UED, at ARRL HQ.

73,

A handwritten signature in dark ink, appearing to read 'Paul L. Rinaldo', with a stylized flourish at the end.

Paul L. Rinaldo, W4RI
Chairman

Before the
Federal Communications Commission
Washington, D. C. 20554

PR
FCC 86-18
36413

In the Matter of

Amendment of Part 97 of the
Commission's Rules to permit
automatic control of amateur
radio stations.

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)
)
)
)

PR Docket No. 85-105

RM-4879

REPORT AND ORDER

Adopted: January 13, 1986 ; Released: January 16, 1986

By the Commission:

1. On April 5, 1985, the Commission adopted a Notice of Proposed Rule Making (50 F. R. 15196; April 17, 1985) to permit any amateur station to be under automatic control provided that operation was on frequencies above 29.5 MHz and that no third-party traffic was transmitted. This was an expansion of the proposal requested by The American Radio Relay League, Inc. (ARRL), who had requested automatic control only for stations transmitting digital communications while operating on frequencies above 30 MHz. Nineteen comments and one reply comment were filed in this proceeding.¹

2. Our Notice of Proposed Rule Making in this proceeding, supra, particularly invited amateur radio operators experienced in automatic control to submit comments on the practicality of expanding automatic control to encompass all amateur operations, not just digital communications. Such comments were not forthcoming. Because of the lack of user support, we will adopt only the ARRL's recommendation to limit automatic control to digital communications on very high frequencies (VHF) and above. (We select 50 MHz rather than 30 MHz, as the petitioner requests, because there are no amateur frequencies between 29.7 and 50 MHz).

1. Comments filed by the American Radio Relay League, Inc., (ARRL), Robert C. Clements, Jess de la Cuesta and Joseph Anthony Wolos were filed late. Consideration of the viewpoints expressed in those comments will aid in the resolution of this proceeding. Therefore, we accept them.

3. In the Notice, supra, we reminded amateur operators that the current rules require the presence of the control operator at the station control point whenever third-party traffic is being transmitted. We emphasized that the proposed amendments would still prohibit automatic control of the station when it is transmitting third-party traffic. Some commenters were confused about unsupervised third-party traffic. For example, repeater stations are already permitted to be operated under automatic control. However, as with any amateur station, when they are transmitting third-party traffic, the control operator must be present at the control point monitoring and supervising the transmissions.

4. Many of the commenters request that high-speed digital operating modes, such as packet-switching, bulletin boards, computer based message systems and electronic mailboxes be exempt from the requirement that the control operator supervise third-party traffic. They believe that the third-party rules as applied to such high-speed digital communications are impracticable and would, in effect, nullify the advantages of automatic control. To acquiesce in that request would be inconsistent with other types of amateur operation. Third-party traffic is radio communications on behalf of anyone other than the control operator.² Neither the speed at which the message is transmitted nor the emission mode (voice, telegraphy, digital etc.) changes its character. This was pointed out in our letter of October 19, 1978, to Richard L. Baldwin, then General Manager of the ARRL.³ In that letter, we reiterated that unsupervised third-party traffic by amateur stations is not permitted.

5. Some comments suggest that the third-party traffic rules be amended so that they would be applicable only at the time the third-party traffic is first introduced into the amateur communications system. However, screening the message content at its introduction does not change the character of the traffic. It is still third-party traffic which must be closely regulated in the non-common carrier Amateur service. Otherwise, amateur facilities and frequencies would be open to non-amateurs and could eclipse other amateur uses. Moreover, we are also concerned about the final destination of the message. We do not want to give our approbation to a mechanism which could be used to circumvent the International Radio Regulations which forbid exchange of amateur third-party traffic between countries who are not parties to agreements permitting such traffic.

2 Section 97.3(v).

3 FCC 78-742; 70 F.C.C. 2d 1303. See also News Release No. 2028, October 25, 1978.

International third-party radio communications are prohibited by Section 97.114 of the amateur rules and Article 32, number 2733 of the International Radio Regulations (Geneva, 1979), except where arrangements have been made between the two countries involved, Article 32, number 2734.

6. Some commenters suggest that MF and HF frequencies between 1.8 and 29.5 MHz be added to the frequencies available for automatic control or that automatic control be extended at least to all digital communications below 29.5 MHz on a regular basis or by temporary special authority (STA). They state that coast-to-coast coverage for point-to-point message handling would be accommodated by including MF and HF frequencies. Because of the possibility of congestion on the MF and HF frequencies, we do not believe that it would be advisable to permit automatic control on those frequencies.

7. Robert C. Clements is under the impression that we inserted a clarification into proposed Section 97.79 (b) that the station licensee is presumed to be the control operator of the station, unless there is documentation to the contrary. However, this is essentially the same as the present wording of Section 97.79(b). The words "at all times" will be deleted from this rule in order to be consistent with the revised wording of Section 97.3(m)(3)

8. For the reasons given herein, we amend our rules to permit automatic control only for digital communications on amateur frequencies 50 MHz and above. Further, we affirm our present rule that requires the control operator to be present at the control point whenever the station is engaging in third-party traffic.

9. IT IS ORDERED, That Part 97 is amended as set forth in the Appendix hereto. This action is taken pursuant to the authority contained in Sections 4 (i) and 303 (r) of the Communications Act of 1934, as amended.

10. IT IS FURTHER ORDERED, That these rule amendments shall become effective, March 14, 1986.

11. IT IS FURTHER ORDERED, That the Secretary shall cause a copy of this Report and Order to be published in the Federal Register.

12. IT IS FURTHER ORDERED, That this proceeding is terminated.

13. Information in this matter may be obtained by contacting Maurice J. DePont, (202) 632-4964. Private Radio Bureau, Federal Communications Commission, Washington, D.C. 20554.

FEDERAL COMMUNICATIONS COMMISSION

William J. Tricarico
Secretary

Attachment: Appendix

APPENDIX

Part 97 of Chapter I of Title 47 of the Code of Federal Regulations is amended, as follows:

1. The authority citation for Part 97 continues to read as follows:

Authority citation: 48 Stat. 1066, 1082, as amended;
47 U.S.C. 154, 303.

2. Section 97.3 (m) (3) is amended to read:

§ 97.3 Definitions.

* * * * *

(m) * * *

(1) * * *

(2) * * *

(3) Automatic control means the use of devices and procedures for control without the control operator being present at the control point when the station is transmitting.

3. Section 97.79 (b) is amended to read:

§ 97.79 Control operator requirements.

* * * * *

(b) Every amateur radio station, when transmitting, must have a control operator. The control operator must be present at the control point of the station, except when the station is transmitting under automatic control. The control operator must be a licensed amateur radio operator or permittee designated by the station licensee. The control operator and the station licensee are both responsible for the proper operation of the station. For purposes of enforcement of the rules of this part, the FCC will presume that the station licensee is the control operator of the station, unless documentation to the contrary exists.

4. Section 97.69 is amended by adding a new paragraph (d), as follows:

§ 97.69 Digital communications.

* * * * *

(d) An amateur station may be under automatic control when transmitting digital communications on frequencies 50 MHz and above.

5. A new section 97.80 is added, as follows:

§ 97.80 Operation under automatic control.

(a) When under automatic control, devices must be installed and procedures must be implemented which will ensure compliance with the rules when the control operator is not present at the control point of the amateur station.

(b) No amateur station may be operated under automatic control while transmitting third-party traffic.

(c) Automatic control of an amateur station must cease upon notification by the Engineer-in-Charge of a Commission field office that the station is transmitting improperly or causing harmful interference to other stations. Automatic operation must not be resumed without prior approval of the Engineer-in-Charge.

6. Section 97.114 is amended by adding a new subparagraph (4) to paragraph (b) as follows:

§ 97.114 Third-party traffic.

* * * * *

(b) * * *

(4) Third-party traffic from an amateur station under automatic control.

* * * * *



THE AMERICAN RADIO RELAY LEAGUE, INC.

ADMINISTRATIVE HEADQUARTERS NEWINGTON, CONNECTICUT, U. S. A. 06111

(203)-666-1541

TO: ▷

Digital Committee

DATE

1/15/86

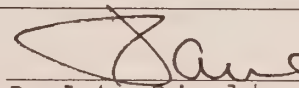
SUBJECT

Automatic Control

MESSAGE

Here is a FAXed photocopy of a photocopy of an FCC news release on PR Docket 85-105. On the surface, it looks like this is not what we wanted. However, we haven't seen the actual report and order, which may clear up the matter of control during transmission of third-party traffic. I'll get you the full text as soon as we get it.

SIGNED


Paul L. Rinaldo, W4RI, Chairman

ORIGINAL



NEWS

FEDERAL COMMUNICATIONS COMMISSION
1919 M STREET, N.W.
WASHINGTON, D.C. 20554

News media information 202 / 254-7874
Recorded listing of releases and texts
202 / 632-4032

1964

This is an unofficial announcement of Commission action. Release of the full text of a Commission order constitutes official action. See *MO v. FCC*, 515 F.2d 385 (D.C. Cir. 1975).

Report No. DC-358

ACTION IN DOCKET CASE

January 14, 1986

FCC AUTHORIZES AUTOMATIC CONTROL FOR DIGITAL COMMUNICATIONS ON AMATEUR FREQUENCIES 50 MHz AND ABOVE (PR DOCKET 85-105)

The FCC has amended the amateur rules to permit automatic control for digital communications on amateur frequencies 50 MHz and above.

The American Radio League, Inc. had asked for an amendment on frequencies above 30 MHz. The Commission said 50 MHz had been selected rather than 30 MHz because there were no amateur frequencies between 29.7 and 50 MHz.

Commenters had requested that high-speed digital operating modes, such as packet-switching and electronic mailboxes, be exempted from the requirement that the control operator supervise third-party traffic. However, the FCC found that neither the speed with which the message is transmitted, nor the operating mode justified any deviation from the rule requiring that the control operator of the amateur station be present at the control point whenever the station was engaging in third-party traffic.

Action by the Commission January 13, 1986, by Report and Order (FCC 86-18). Commissioners Fowler (Chairman), Quello, Dawson and Patrick.

-FCC-

For additional information call Maurice J. DePont at (202) 632-4954.

The first part of the paper discusses the importance of the study and the objectives of the research. It also outlines the methodology used in the study and the results obtained. The second part of the paper discusses the implications of the study and the conclusions drawn from the research. It also provides a summary of the findings and a list of references.

The study was conducted in a laboratory setting and involved the use of a variety of equipment and materials. The results of the study were compared with those of previous studies and found to be in good agreement. The implications of the study are discussed in detail and the conclusions drawn from the research are presented. A summary of the findings is provided and a list of references is included.

The study was conducted in a laboratory setting and involved the use of a variety of equipment and materials. The results of the study were compared with those of previous studies and found to be in good agreement. The implications of the study are discussed in detail and the conclusions drawn from the research are presented. A summary of the findings is provided and a list of references is included.

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Before the
Federal Communications Commission
Washington, DC 20554

In the matter of)	
Amendment of Part 97 of the)	PR Docket No. 85-105
Commission's Rules to permit)	
automatic control of amateur)	RM-4879
radio stations.)	

PETITION FOR RECONSIDERATION

Filed by:
Tucson Amateur Packet Radio
P.O. Box 22888
Tucson, Arizona 85734

To the Commission:

Tucson Amateur Packet Radio, a club with international membership consisting of 1400 amateur packet radio enthusiasts which has coordinated the volunteer development of many of the major building blocks of the existing amateur packet network, and whose members have contributed since 1981 in the development of packet radio hardware, software, and operating procedures, hereby submits this petition for reconsideration of the report and order on PR docket No. 85-105. Our comments are limited to activities and operation above 50 MHz, as 85-105 only addresses these frequencies.

Our reasons for requesting a reconsideration are:

1) The inclusion of third-party traffic limitations, given the current definition of third-party traffic, puts severe constraints on the design and utilization of the developing packet radio network.

The questions that arise in the amateur packet community over this issue are mainly semantic ones, caused by attempting to force new technologies to fit the old definitions supplied by 97.3. The FCC has stated both at amateur gatherings and in the comments associated with several recent actions that it is interested in promoting computer assisted amateur communications and what is commonly referred to as Computer-Based-Message-Systems (CBMS), or Bulletin Board Systems (BBS). Bulletin Boards are central repositories of messages sent between two or more parties. The messages are stored for indefinite periods of time on the bulletin board until they have been read by all parties concerned. The messages are seldom sent on behalf of the control operator of the BBS itself, and that's where the third-party rules begin to cloud the issue.

By strict application of the current definition of third party traffic :

97.3(v) Third party Traffic. Amateur radio communication by or under the supervision of the control operator at an amateur radio station on behalf of anyone other than the control operator.

A digital BBS system under automatic control could not transmit messages stored on it that are not originated by or destined for the control operator of that BBS. This makes illegal the major purpose of the bulletin board system.

During the early development and on the air testing of packet radio message systems, amateurs have viewed the message relay device as a repeater. A repeater, as defined by 97.3(1), is a device that automatically retransmits the radio signals of other amateur radio stations. Part 97 does not specify a minimum length for the time delay between receipt of the radio signal and its retransmission.

Repeaters, as commonly used, can pass traffic between two amateurs, neither of whom are control operators of the repeater, without having that traffic defined as third-party. Repeaters have regulatory limitations of their own, however, and the development of more complex message systems and other packet switching devices will soon pass beyond the limits of the current definition of "repeater".

Existing amateur BBS systems are already handling large numbers of messages. Recent statistics reported by east coast stations show counts of more than 1000 messages per month at each of several sites. These systems are developing more sophisticated methods of automatically forwarding messages from site to site.

To review, the language specified by 85-105, makes the BBS function, desired by both the amateur population and the FCC, illegal unless the BBS is classed as a repeater. Imminent developments in packet radio will make this classification invalid for some devices under the current definitions. Therefore, 85-105, while attempting to permit continued experimentation, actually inhibits it.

A fix for this problem could be to include language in part 97 that specifically states that traffic originated by an amateur station on behalf of an amateur and destined for an amateur is not third-party traffic. This would make the permitted activities of automatic control digital devices, serving in a relay capacity but not classified as repeaters under the current definitions, match the permitted activities of classic repeaters. We note that several countries which prohibit third party messages (including West Germany, Norway, Japan and New Zealand) have chosen the interpretation that amateur-to-amateur messages passed thru packet radio BBS networks do not constitute third party traffic.

2) The inclusion of third-party traffic restrictions, for traffic of a character not discussed in 1) above, will severely limit the utility of packet radio networks for public service applications.

The following discussion presumes the acceptance of the above argument, and that the type of third-party traffic discussed is traffic on behalf of someone other than the control operator of the origination or destination station.

The FCC has done much to promote the use of high speed digital communications in the amateur service. The constant growth of experimentation in packet radio began when the use of the ASCII code at speeds of 300 bps and more were permitted. The majority of digital communications currently takes place at 1200 bps. 9600 bps is in limited use now, with 56kbps devices under construction.

A requirement that third-party traffic be monitored at each relay point in the network will limit the speed of the network to that of the reading speed of the slowest control operator. It would probably force the construction of two parallel networks, one at low speed for third-party traffic, and one at high speed for non-third-party traffic. This is undesirable.

The requirement to monitor the traffic at each relay point in the network also places severe constraints on the design and implementation of the network. In most of the networks now under discussion, the message is only guaranteed to appear in its entirety at its entry to the network, and at its exit. While the message is in the network, it is broken into many small pieces. They may be out of sequence as they pass a relay point. Some parts of the message may take a different path through the network.

With such message fragmentation, a control operator at an intermediate relay point may not have sufficient information as to the content of the message being relayed to correctly judge whether the character of the message is that of third-party traffic or not.

On the other hand, TAPR and its members share the FCC's concern over potential abuse of the network by commercial interests. The problem then becomes one of making sure the amateur regulations are followed, while at the same time making it possible to build the network.

We believe that it is possible to meet both of these goals. The key is in treating the packet radio network, consisting of an unspecified number of relay stations, as a "pipe". The pipe has an input and an output. At the entrance and exit to the pipe are non-automated control operators, who are ensuring compliance with the rules. Once a message has been placed in the pipe by a control operator, it need not be rechecked by an operator at each

relay point that makes up the pipe. The message is again checked by a control operator at the end of the pipe if it is destined for a third-party. The amateur who was the control operator at the origination point of the message is responsible for ensuring compliance with the rules.

We cite as an example: Assume that a network exists between San Francisco and Los Angeles. There are two parallel paths in this network, one that runs down the coast at 9600 bps on 221.95 MHz, and a second that runs via Sacramento through the central valley. An earthquake simulation is taking place between the Red Cross in San Francisco and the State Office of Emergency Services (OES) in Los Angeles. The Red Cross has entered a series of damage reports and hospital bed estimates into a hand-held computer. There are 40,000 characters of data involved. They hand the computer to an amateur to transmit the data to Los Angeles over the amateur packet network. This is obviously third-party traffic. It is also obviously something that could not have been sent using voice, Morse code, or other slow data rate modes, in less than five hours.

The amateur in San Francisco reviews the data and determines that it meets the amateur rules and regulations. He then, as control operator of a station attached to the entry point of the network, (the pipe), enters the data into the network. It now flows through the pipe toward Los Angeles. Also in the pipe, simultaneously, are perhaps 20 other two way conversations. Monitoring of the messages while in transit through the pipe is difficult to do as it flows at high speed through two different paths. Part of the messages may even be automatically stored on disk at an intermediate point if the Los Angeles end of the network is down or congested. Once the message traffic is in Los Angeles, the control operator of the station at the final destination reviews them before passing them to the third-party.

A question that will certainly be raised at this point is, "Is this actually likely to occur in the near future?" Yes. The predecessor to the network above exists now. There are 5 relay points along the coast between Los Angeles and San Francisco operating on 145.01 MHz at 1200 baud. There are 4 relay points that go up the central valley on 145.05 MHz at 1200 baud. During an exercise with the State OES, amateurs were handed a disk from an Apple II computer which contained simulated third-party traffic. This traffic was relayed through the network to an attended BBS system in San Francisco where it was stored and later transmitted through a second network to Sacramento. Similar networks and public service drills exist in other areas of the country. Large networks exist in the New England area, the Mid Atlantic States, and in Florida.

The only thing missing between the imaginary scenario and the actual one is higher baud rates and an increased level of automatic control. Both of those elements will be required if the amateur network is to provide a high level of service and reliability in time of need.

To review, we suggest that the network be viewed as a pipe, and that control operators at the input and the output to the pipe are sufficient to ensure compliance with third party traffic regulations.

At no time do we recommend that the third parties themselves be given direct access to the network.

The question of unauthorized, i.e. commercial, access to the network must be discussed. Since the regulations for traditional non-digital repeaters do not require constant monitoring, neither should the elements of a digital network. The only monitoring required for repeaters under automatic control is when third-party traffic is involved, this topic is discussed above. Monitoring does go on, however, in the course of daily amateur activities.

Policing of the amateur frequencies to keep intruders out has always had a great deal of support in the amateur community, and high speed digital communications will be no different. Although the same things that make it hard to monitor third-party traffic "in the pipe" will also affect an intruder watch, the intruder must still use the same pipe input as everyone else. Here, monitoring is easy. In fact, at its simplest level, packet radio is the embodiment of the FCC's underlying requirements for automatic control, "devices must be installed and procedures must be implemented...". The network entry and exit points are rigidly controlled by the protocols inherent in packet radio. Although the particular procedures will change as the network evolves, their attributes will remain the same. The originating and destination station are readily discernible. Activity is easily monitored and tracked by a computer. The devices necessary to do this monitoring will be readily available, since they are the same devices used by the general amateur population for access to the network. The prices of such devices have fallen from \$500 to \$99.00 in three years as the number of amateurs using the mode rose from 200 to 14,000.

In summary for point 2), we believe that a requirement to monitor third-party traffic at each relay point in the network places such severe constraints on the design and implementation of the network as to bring the feasibility of construction of such a network into question. The alternative of making the network off-limits to third-party traffic would be to fall far short of the requirements of 97.1(a).

We believe that this problem can be fixed by adding a clause to the new 97.80(b) as follows:

[(b) No amateur station may be operated under automatic control while transmitting third-party traffic]

, unless that station is serving in a relay role in a

network of digital stations where the traffic was
originated at a station not under automatic control.

and elsewhere when third-party traffic is discussed.

TAPR wishes to thank the FCC staff for their obvious interest in
amateur packet radio and its continuing development.

/s/ TLA (CLL)

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Tucson Amateur Packet Radio
P.O. Box 22888
Tucson, Arizona 85734

1. Transmit Timing

TXdelay

specifies delay from TX key down to data start (sends synchronizing flags, occupying channel) {TNC2 10mS} {TNC1, Kan 40mS}

an interesting side effect is that setting TXdelay to 0 disables the random backoff timer {DED T 10mS} {GLB SF flag_chars}

AXDelay

specifies time to wait for standard "voice" repeater to key up {TNC2 10mS} {TNC1, Kan 120mS}

AXHang

don't need to wait for AXDelay if there has been activity within this amount of time {TNC2 100mS} {TNC1, Kan 120mS}

REpeater

unique to the Kantronics, causes AXDelay and AXHang to be enabled or ignored

Therefore, keyup delay = (TXdelay*<scalefac> + AXDelay*<scalefac>) unless there has been activity on the channel within the last AXHang*<scalefac>. This time must be allow for (1) modem to start, (2) your transmitter to have output on frequency, (3) receiving station to detect your signal.

2. Packet Timing

FRack

specifies frame acknowledgement timeout value {TNC2, TNC1, Kan 1S} {DED F 1S} {GLB ST 100mS}

This time is also extended proportional to the number of digipeaters in use. The retry interval = FRack * (2 * number_of_repeaters + 1).

DWait

this parameter is used in an attempt to avoid collisions with digipeated packets and specifies the default wait time after the last data on the channel before starting the key up sequence. Digipeaters do not wait this time to start their transmissions when they have a packet to be repeated, so (in theory) they can capture the channel every time, rather than have data accumulate in the repeaters. {TNC2, 10mS} {TNC1, Kan 40mS} {DED W 10mS}

Tom Clark, W3IWI, has suggested the following values as a way of best utilizing the available channel capacity:

Station Type	mS Delay
=====	=====
Digipeater	0
Keyboard QSO	160
BBS	320
file xfer	480

DWait can be set to 0 in noisy environments like HF and OSCAR operation where DCD can falsely lock to noise (chatter).

The interval between carrier dropping and the TNC's first attempt at transmitting a packet is $DWAIT * \langle scalefac \rangle$. For subsequent transmissions of the same packet the interval is $DWAIT * \langle scalefac \rangle + random_number * 40$. The random number (between 0 and 15) permits two colliding stations to backoff (generally) differing amounts of time, with the goal being that they will not collide repeatedly.

RESptime

the minimum delay before sending an acknowledgement packet (runs concurrently with DWait and random back-off) This delay is useful in file transfers, since it allows the sending TNC time to finish packetizing and sending MAXframe packets before the receiver hops in with an acknowledgement. {TNC2 100mS} {DED @T2 10mS} {GLB SP 2mS}

3. Packet Construction

MAXframe

between 1 and 7, this parameter specifies the maximum number of outstanding unacknowledged packets at any given time {D 0} {GLB SH}

Paclen

specifies maximum number of octets in the data portion of a packet {GLB SL}

In file transfers, care should be taken to choose MAXframe and Paclen so that the receiving TNC's data buffer is not filled.

PACTime and CPactime

PACTime can be used to specify the timing of packets that are generated EVERY given interval or AFTER a given interval passes with no input from the computer or terminal in transparent mode. If CPactime is on, this timing parameter also applies in CONVers mode, and

will generate packets in addition to the SEndpac character. In no event is a 0 length data packet ever generated, and the timer does not start until the first byte is entered. {TNC2, TNC1, Kan 250mS} {DED K 250mS} {GLB OI 5S}

4. Link Maintenance

CHeck

after this interval without hearing a packet from the other station, the integrity of the link is checked (in most AX.25 Version 2 implementations), and if the other station is not reached, the TNC will act Disconnected. In version 1, simply disconnects. {TNC2, TNC1, Kan 10S} {DED @T3 10mS} {GLB SQ approx 20S}

5. Miscellaneous

REtry

specifies the number of times to retry transmission of unacknowledged packets. Can be disabled by setting it to 0, which is a normally a VERY bad idea. {DED N} {GLB SN}

DIGipeat

enables/disables use of your TNC by others as a digipeater {DED R} {GLB MR}

XMitok

enables/disables all transmitter functions {DED X} {GLB AS (also disables receiver)}

RADIO AMATEUR SATELLITE CORP.

P.O. BOX 27 -- WASHINGTON, DC 20044

AMSAT U.S.A. AREA COORDINATORS - JAN. 1986

CALL	NAME	ADDRESS	CITY & ZIP CODE	PHONE NUMBER
1ST CALL AREA				
K1DS	ROSEN, RICK	321 TABER AVE.	PROVIDENCE, RI 02906	HOME (401) 272-5626
K1LJL	WARLEY, STEPHEN	63 MOORE DRIVE	BURLINGTON, VT 05401	HOME (802) 658-3679
KA1M	DESKUR, ANDY	71 ADAMS AVE.	METHUEN, MA 01844	HOME (617) 688-0210
N1BRQ	BESSETT, TIMOTHY	76 BARRETT ST.	SO. BURLINGTON, VT 05401	HOME (802) 863-6159
W1IAS	POWER, TED	40 MASSACHUSETTS CT.	FALMOUTH, MA 02540	HOME (617) 548-1611
W1JSM	BROWN, DON	638 POST ROAD	GREENLAND, NH 03840	HOME (603) 436-6745
W1NU	POLITI, VICTOR D.	69 FLAX RD.	FAIRFIELD, CT 06430	HOME (203) 259-4655
K66LC/1	ROEMER, PAUL G.	90 LEE AVE.	MANCHESTER, NH 03103	HOME (603) 623-7613
2ND CALL AREA				
KA2MUM	BEEMAN, PAUL	62 'A' DILMONT DR.	SMITHTOWN, NY 11787	HOME (516) 269-4923
KW2U	SODERMAN, R. E.	43 COUNTRY SQUIRE RD	OLD TAPPAN, NJ 07675	HOME (201) 666-2870
N4EL/2	BEERMAN, RICHARD	131 WESTFIELD RD.	FANWOOD, NJ 07023	HOME (201) 889-1873
WA2LJM	TRAYER, RAMON	48 CARROLL ST.	POUGHKEEPSIE, NY 12601	HOME (914) 454-3249
3RD CALL AREA				
K3JL	LOW, JOHN	RT. 2 - BOX 2446	GEORGETOWN, DE 19947	HOME (302) 856-2307
K3PTQ	CROLL, MILLARD	435 HUGHES ROAD	KING OF PRUSSIA, PA 19406	HOME (215) 964-0422
N3CE6	BRECHIN, MEL	3309 CARDENAS AVE	BALTIMORE, MD 21213	HOME (301) 732-4753
W3KH	RUPERTO, E. F.	RD 1 BOX 366	WEST ALEXANDER, PA 15376	HOME (412) 663-5004
WA3GOV	ZISERMAN, HOWARD	2200 BEN FRANKLIN PKWY #717N	PHILADELPHIA, PA 19130	HOME (215) 563-5254
WA6YBT/3	ROSENBERG, ERIC	P.O. BOX 15636	HARRISBURGH, PA 17105	HOME (717) 236-6000 EXT 268
4TH CALL AREA				
WB2LEI/4	MALIN, JERRY	709 MADRAS LANE	CHARLOTTE, NC 28211	HOME (704) 364-1635
K4SR	BISHOP, RICHARD	305 LAKEWOOD DRIVE	MONETA, VA 24121	HOME (703) 297-5550
KB4AKQ	MYERS, BOB	346 PARKDALE DRIVE	CHARLESTON, SC 29407	HOME (803) 556-5022
KJ4BF	BARNETT, LEE	701 E. CURTIS ST.	SIMPSONVILLE, SC 29681	HOME (803) 967-3963
N4EQT	SHOUSE, JERRY	1050 HICKORY HILL RD.	LAWRENCEBURG, KY 40342	HOME (502) 839-4041
N4HY	MCGWIER, BOB	917 MCKINLEY AVE.	AUBURN, AL 36830	HOME (205) 821-6758
N4IFD	CRISLER, MICHAEL J.	8341 S.W. 137TH AVE.	MIAMI, FL 33183	HOME (305) 382-4044
W4AMI	BARBEE, ROBERT W. JR	2989 CARNOUSTIE RD.	MEMPHIS, TN 38128	HOME (901) 357-4386
W4AUZ	SHEPHERD, WM. R.	325 TAYLOR DR.	LEXINGTON, KY 40505	HOME (606) 254-4228
W4BIW	LINDSEY, BYRON	1356 VISTA LEAF DR.	DECATUR, GA 30033	HOME (404) 636-7452
W4DAQ	JORDAN, MACK	P.O. BOX 1027	DEMOPOLIS, AL 36732	HOME (205) 289-1225
W4DWN	DIXON, WALTER	820 NE 123 STREET	MIAMI, FL 33161	HOME (305) 895-0398
W4EEE	NORTON, GEORGE F.	250 MILLEDGE TER.	ATHENS, GA 30606	HOME (404) 543-3572
W4FJ	MATHEWSON, TED	1525 SUNSET LANE	RICHMOND, VA 23221	HOME (804) 355-5118
W4KDP	WHITEHURST, ROBERT	25 ARCADIA	TUSCALOOSA, AL 35401	HOME (205) 553-1282
WB4URU	FITZ, HENRY	3354 KEGLER DRIVE	JACKSONVILLE, FL 32216	HOME (904) 737-3569
W4ZPG	CLOWE, COL. JOHN	4144 INDIAN MANOR DR	STONE MOUNTAIN, GA 30083	HOME (404) 299-2030
WD4HWO	POWER, BRUCE	1321 NANCY DRIVE	TALLAHASSEE, FL 32301	HOME (904) 877-3635
WD4PQN	FORTE, ALFRED	9302 SPRING TERRACE	OCALA, FL 32672	HOME (904) 687-1518
W0CA/4	LAUB, NICK	3951 VOORNE STREET	SARASOTA, FL 33580	HOME (813) 355-4824
5TH CALL AREA				
KA5DNP	DOUGLAS, JACK	2019 WILLOW POINT DR.	KINGWOOD, TX 77339	HOME (713) 358-5172
KN5D	THANNISH, ROBERT	P.O. BOX 997	CORRALES, NM 87048	HOME (505) 898-3859
KT5U	REEVE, RUSTY	RT. #2 BOX 211-D	MCKINNEY, TX 75069	HOME (214) 442-1217
N5ARS	PARRIS, BILL	4801 SO. 96TH ST.	FORT SMITH, AR 72915	HOME (501) 452-1689
N5BRG	STRICKLIN, R. S.	2225 ARBOR CREST	CARROLLTON, TX 75007	HOME (214) 442-4218
N5BXP	FUGLAAR, HAL	2034 HAMILTON	ROSENBERG, TX 77471	HOME (713) 342-4610
N5EAR	LASKEY, MIKE	17618 WILD WILLOW	HOUSTON, TX 77084	HOME (713) 550-3106
NC5Y	TEW, GEORGE	1209 SPRINGDALE DR.	JACKSON, MS 39211	HOME (601) 956-4724
WA5WHN	MILLER, JAY D.	4613 JUPITER N.W.	ALBUQUERQUE, NM 87107	HOME (505) 344-6734
WB5PMR	BRINCKERHOFF, A.	1507 SAN ANTON LANE	LEWISVILLE, TX 75067	HOME (214) 436-4823
WD5GLD	RUHL, RICHARD	P.O. BOX 539	KINGFISHER, OK 73750	HOME (405) 375-4843
WD5IKD	CLARK, ALAN	2325 MILAM ST.	PEARL, MS 39208	HOME (601) 932-2495
WA9PZL/5	LEY, ROGER	2514 DEAS	BOSSIER CITY, LA 71111	HOME (318) 746-0356
W5IU	PUGH, KEITH	P.O. BOX 12492	FORT WORTH TX 76116	HOME (817) 292-5633
6TH CALL AREA				
N6TE	BLUESTEIN, HARRY	5533 MOONLIGHT LANE	LA JOLLA, CA 92032	HOME (619) 454-1098
WA6HBV	STRONG, JUDD B.	185 SALINAS DRIVE	VACAVILLE, CA 95688	HOME (707) 446-4748
WA6VGS	SOMERS, JACK	P.O. BOX 49751	LOS ANGELES, CA 90049	HOME (213) 478-1717
WB6GFJ	FORBES, ROSS	P.O. BOX # 1	LOS ALTOS, CA 94022	HOME (415) 948-5000
WB6LLO	GUIMONT, DAVID	5030 JULY ST.	SAN DIEGO, CA 92110	HOME (619) 275-1495
WH6AMX	DITTMER, R. G.	7305D ALOALO STREET	HONOLULU, HI 96818	HOME (808) 422-5691
W6AMW	DALLESKE, ROBERT	P.O. BOX # 220	MCCLOUD, CA 96057	HOME (916) 964-3154
W6CG	SCHULTZ, C. F. (BUD)	3050 W. BALL ROAD #154	ANAHEIM, CA 92804	HOME (714) 826-4850
W6HDO	BUTTSCHARDT, CLIFFORD	950 PACIFIC ST.	MORROW BAY, CA 93442	HOME (805) 772-2132
W6KAG	MASON, M. A.	5 BRIDLE LANE	RANCHO PALOS VERDES, CA 90274	HOME (213) 831-4905

CALL	NAME	ADDRESS	CITY & ZIP CODE	PHONE NUMBER
7TH CALL AREA				
AA7A	STEARNS, EDWARD	7038 E. ASTOR DR.	SCOTTSDALE, AZ 85254	HOME (602) 948-5080
K7SFN	DZUIDA, FRANK	225 WEST COYOTE DR.	CARSON CITY, NV 89701	HOME (702) 849-1841
K7ZOK	LEARY, HAL	3625 WATER HOLE ST.	LAS VEGAS, NV 89130	HOME (702) 645-4527
KA7APJ	SMITH, JIM	5717 N.E. 56TH	SEATTLE, WA 98105	HOME (206) 523-6167
KI7L	PETERSON, STEPHEN	3791 S. 1860 EAST	SALT LAKE CITY, UT 84106	HOME (801) 278-2727
KL7ETZ	LEWIS, DAVE	309 WACHUSETTS	SITKA, AK 99835	HOME (907) 747-6948
KL7JHX	SEARLES, HARRY	BOX 585	VALDEZ, AK 99686	HOME (907) 835-2347
KY7J	COLE, KEN	P.O. BOX 1978	POULSBORO, WA 98370	HOME - UNKNOWN -
W7FF	SWAFFORD, JAMES	5906 W. MIRAMAR DRIVE	TUCSON, AZ 85715	HOME (602) 298-7793
W7KMF	MABBOTT, LYLE	P.O. BOX 618	DUBOIS, WY 82513	HOME (307) 455-2956
W7LSV	BARNARD, DAVID F.	9630 SW ALSEA DR	TUALTIN, OR 97062	HOME (503) 692-1036
W7RZY	ROYLANCE, HARRY	216 SO. M STREET	LIVINGSTON, MT 59047	HOME (406) 222-0655
W7TY	WOERTENDYKE, HOWARD	RTE. 1 BOX 603	KAMIAH, ID 83536	HOME (208) 935-2361
W7US	ALLEN, WILLIAM	P.O. BOX 503	SONOITA, AZ 85637	HOME (602) 455-5341
8TH CALL AREA				
KA8TSR	ELLISON, JOHN	#3 BERSON AVE.	WHEELING, WV 26003	HOME (304) 232-2667
K8MU	KOZIEL, LARRY J.	42509 PARKHURST	PLYMOUTH, MI 48170	HOME (313) 420-0786
K800	BROOME, WENDELL	2400 RUDGATE DR. N.W.	GRAND RAPIDS, MI 49504	HOME (616) 784-3579
K0BI/8	ROOP, JIM	P.O. BOX 255	ALLEGAN, MI 49010	HOME (616) 673-2093
N8AEG	TESSNEER, KENNETH	4575 ARROWHEAD TRAIL	ENON, OH 45323	HOME (513) 864-1156
N8ATB	BERMAN, JOSEPH H.	P.O. BOX U	ATHENS, OHIO 45701	HOME (614) 592-3931
N8DOD	TEEPLE, JIM	1230 WARD N. W.	WARREN, OH 44485	HOME (216) 399-7292
N8ETY	KIFER, DAVE	3717 WOODWAY AVE.	PARMA, OH 44134	HOME (216) 459-0676
W8P6P	BURGGRAF, R. G.	988 PROSPERITY RD	WAVERLY, OHIO 45690	HOME (614) 947-5483
W8LAJ	MOORE, GERALD W.	114 ST. FRANCIS AVE.	TIFFIN, OHIO 44883	HOME (419) 447-6719
W8RYD	MARCHAL, JEROME	270 W. SHARON RD	CINCINNATI, OH 45246	HOME (513) 772-0724
W8IFM	SCHRIK, GERD	4741 HARLOW DR.	DAYTON, OH 45432	HOME (513) 253-3993
W8ZTV	KNOLLINGER, D. E.	RD 4 BOX 230	MOUNDSVILLE, WV 26041	HOME (304) 845-1301
9TH CALL AREA				
K1FJ/9	JAWORSKI, FRANK	3923 OAKLEAF DRIVE	FORT WAYNE, IN 46815-5421	HOME (219) 484-3222
NZ4Q/9	KEARNEY, TIMOTHY	6421 WAYOTA COURT	FORT WAYNE, IN 46815	HOME (219) 485-9651
K9NO	BOCCI, PAUL	23 W. 732 PINE ST.	ROSELLE, IL 60172	HOME (312) 351-5213
K9PVW	LEARNER II, K. D.	P.O. BOX 5014	KOKOMO, IN 46902	HOME (317) 453-2947
N9HR	WRENSCH, TOM	N. 7900 HILLCREST ST.	OCONOMOWOC, WI 53066	HOME (414) 567-7382
W9JUV	SCHROEDER, JOE	P.O. BOX 406	GLENVIEW, IL 60025	HOME (312) 724-8831
W9MXC	ROBERTS, LARRY	3300 FERNWOOD	ALTON, IL 62002	HOME (618) 465-2735
W89ANQ	RAHN, BRUCE A.	410 CORDONADO TRAIL	ENON, OH 45323	HOME (513) 864-5803
W89IIC	BEERS, DICK	720 YORK BLVD.	GLENVIEW, IL 60025	HOME (312) 724-2729
0 CALL AREA				
W6IFW/0	OWENS, LEE	1205 SO. 5TH ST.	ATCHISON, KS 66802	HOME (913) 367-4226
KA0000	ELDER, JERRY	3213 FOX HILL RD.	ST. CHARLES, MO 63301	HOME (314) 723-8112
K0GA	ANDERSON, G. A.	5820 CHOWEN AVE SO.	MINNEAPOLIS, MN 55410	HOME (612) 922-1160
K0RL	LILE, RONALD E.	2822 WOODSIDE DRIVE	QUINCY, IL 62301	HOME (217) 223-6698
K0QQ	EKBLAD, ART	1210 7TH STREET S.W.	MINDOT, ND 58701	HOME (701) 852-4289
N0AN	SCHIERS, HASAN A.	P.O. BOX 171	AMES, IA 50010	HOME (515) 434-2368
W0RLY	FLASKA, JOE	10535 W. 26TH AVE.	DENVER, CO 80215	HOME (303) 238-3274
W0CA	LAUB, NICK	ROUTE 1	BACKUS, MN 56435	HOME (218) 947-3501
W0CY	MCKIM, JIM	1404 SO. 10TH	SALINA, KS 67401	HOME (913) 827-2927
W0IT	BURGHARDT, STAN	P.O. BOX 73	WATERTOWN, SD 57201	HOME (605) 886-3767
W0SL	WELCH, ROY D.	908 DUTCH MILL ROAD	MANCHESTER, MD 63011	HOME (314) 391-1127
W0UFZ	COLEMAN, DAN	1039 MISSOURI	ALLIANCE, NE 69301	HOME (308) 762-3751
W0VO	MEANS, ED	212 NORTH FARRAGUT	COLO. SPRINGS, CO 80909	HOME (303) 473-6174

1986?

amateur radio NEWS

The American Radio Relay League, Inc.

Newington, Connecticut 06111

FOR IMMEDIATE RELEASE

FCC OKAYS RETRANSMISSION OF THIRD-PARTY MESSAGES ON PACKET RADIO ABOVE 50 MHz

Newington CT, March 14 -- Today the Federal Communications Commission (FCC) released a waiver of the rules to permit retransmission of third-party traffic via packet radio under certain conditions in response to a Petition for Extraordinary Relief filed by the American Radio Relay League (ARRL).

The following is the text of the waiver:

"(a) The provisions of Sections 97.80(b) and 97.114(b)(4) are waived to permit amateur stations, retransmitting digital packet radio communications (see Section 97.69) on frequencies 50 MHz and above, using the AX.25 (or compatible) protocol, to be operated under automatic control while retransmitting third-party traffic. See section 97.3(v).

"(b) This waiver applies only to the retransmission of third-party traffic originated at another amateur station which is under local control or remote control. See Section 97.3(m).

"(c) When an amateur station is operated under automatic control, devices must be installed and procedures must be implemented which will ensure compliance with the rules when the control operator is not present at the control point of the amateur station. See Section 97.80(a).

"(d) This waiver will remain in effect until the Commission takes final action on the petitions for reconsideration filed in PR Docket No. 85-105."

The Waiver Order goes on to say:

"Control operators of amateur stations capable of monitoring AX.25 packet transmissions must be alert to the increased dependency upon them for monitoring during the period of this waiver. We call upon them to immediately make known to the responsible control operator of a station retransmitting communications under automatic control any misuse of the station so that the control operator can take prompt corrective action."

According to FCC officials, formal Commission action on the pending Petitions for Reconsideration is not scheduled until late summer.

A Standard for Identification of Digital Data via Packet Radio

Preliminary 26 Mar 86

Packet Radio has grown very quickly in recent months and a nationwide network will soon be a reality. All forms of communications will benefit from transmission via digital techniques. For example, digital encoding of voice information or SSTV for transmission via packet is on the horizon.

Because digital data is 'hidden' from humans, a computer readable identification must be included with the non-ASCII data to allow 'reading the mail'. An identification standard that will be universally applied is required.

The ID standard must allow for experimentation, as this is its primary reason for existence. Perhaps the detailed scheme could be similar to the FCC 'emissions type' definition.

Use of an agreed upon standard 'type' description allows a computer to receive the packets and determine the rules to 'display' the message to the user. This might mean the exact algorithm for reproducing a voice or SSTV message. The human could read the type of data by looking up the three 'type' data fields from a table if desired. It is very important to provide enough room in the definition scheme to allow descriptions to grow for many years.

A proposed Standard for ID of Digital Data via packet radio:

Three descriptors:

- | | |
|-------------|---|
| 1. Category | ie. voice, fax, sstv, icons, wx images, software |
| 2. Type | ie. LPC, Std, Robot 36s color, Mac, GOES, Z80 asm |
| 3. Level | ie. 1, 2, 7, 4, 4,3 |

Each descriptor is a one byte (binary) value

Category and Type could be defined early and the entries would not change, but could be added to.

Level would change with each new experimental representation of data.

A standard of this type must be defined by a group of packet experts and enforced in some manner. This is no small task, but would greatly increase the utility of packet radio experimentation.

K.O.

K.O. Learner, II K9PVW P.O. Box 5014 Kokomo, IN 46902
Packets via W9ZRX HF/VHF to K9OP0 for hand delivery.

THE AMERICAN RADIO RELAY LEAGUE INC

MEMORANDUM

March 13, 1986

David Alkire Smith, W8YZ
530 Hollywood Drive
Monroe, Michigan 48161

Dear Dave:

Thank you for your letter. I didn't know it but your letter was in my in box when Len Todd telephoned me.

All I can say is that, as chairman of the Digital Committee, I welcome any input that you, Len and others in Michigan may have on packet frequency usage and coordination. I will be glad to circulate correspondence to the Committee members and work with you to exchange ideas.

Please look at Minutes 45 a and h of the most-recent Board Meeting, p 63, March 1986 QST. Both relate to packet-radio frequencies, and the Digital Committee will be making inputs to the Membership Services Committee for both of these Minutes. Perhaps after the Dayton get-together, you or Len could fill me in on an updated Michigan packet-radio frequency plan.

I advised Len that NI8E's packet frequency plan appears in the March issue of the new QEX, copy enclosed. When you get a revised plan ready to see the light of day, I'll be happy to carry that in QEX in the earliest possible issue.

73,



Paul L. Rinaldo, W4RI
Publications Manager

cc: Larry Koziel, K8MU
Len Todd, N8AGS
Vice President Olson
Vice Director Severson

PLR/cs



THE AMERICAN RADIO RELAY LEAGUE, INC.

LEADERSHIP OFFICIAL

David Alkire Smith W8YZ
530 Hollywood Drive
Monroe, Michigan 48161
(313) 242-5589

- SECTION EMERG. COORDINATOR
- SECTION TRAFFIC MANAGER
- AFFILIATED CLUB COORDINATOR
- BULLETIN MANAGER
- EMERGENCY COORDINATOR
- NET MANAGER
- OO/RFI COORDINATOR
- PUBLIC INFORMATION OFFICER
- STATE GOVERNMENT LIAISON
- TECHNICAL COORDINATOR
- ADVISORY COMMITTEE MEMBER
- NTS OFFICIAL
- QSL BUREAU MANAGER

QST

OFFICIAL JOURNAL

6 Mar 86

Dear Paul W4RI:

Two Assistant Technical Coordinators in the Michigan Section are working very hard in cooperation with the Michigan Area Repeater Council to accomplish packet frequency and mode coordination within the state. While it is not possible for such an effort to be counterproductive, some of their effort might be better directed to giving their valuable input to the ARRL Committee On Digital Communication.

Larry K8MU is the General Manager of Packet Radio In Southern Michigan, also known as PRISM. In addition, he is very active with AMSAT. He is very active with the clubs in the southeastern portion of the state providing talks and demonstrations on many subjects. I believe that he is an engineer by profession.

Len N8AGE is the President of the Western Michigan Packet Radio Association, also known as WMPRA. He has a professional background in computer science and is employed as a trainer for Consumers Power Company.

These two persons, together with the officers of the two organizations make up the advisory committee to the Michigan Area Repeater Council. You may wish to contact them for newsletter exchange. I am sure that either of them can be very helpful as advisors to The League.

Respectfully:

David Alkire Smith W8YZ
VUAC Great Lakes Division
T. C. Michigan Section

cc: George Wilson
Larry Koziel
Len Todd
Tod Olson
Al Severson

Doc. 8A/2
1986-1992

1986 MAR -6 AM 10:00

MINUTES OF MEETING
U.S. OIRA Ad Hoc Study Group 8A-Land Mobile
Held on February 21, 1986
At the Motorola, Inc. Conference Room
Suite 300 1776 K St. N.W.
Washington, D.C. 20006

Convenor Wm. Borman called the meeting to order at 9:30 a.m. with the following persons in attendance:

NAME	AFFILIATION	TELEPHONE
Wm. Borman, Convenor	Motorola, Inc.	202 862 1500
Sam McDonough, Sec'y.	FCC	202 632 7500
H.W. (Pete) Arnold	Bellcore	201 758 2982
H. T. Blaker, U.S. Chmn. SG-8	Rockwell Int'l.	703 553 6687
L. D. Reed	FCC/PRB	202 632 7175
W. J. Riordan	AT&T Bell Labs	201 870 7849
C. E. Rice	Bellcore	201 740 4567
P. T. Porter	Bellcore	201 758 2983
Lee Zahalka	GTE Labs	617 466 2397
Jim Mikulski	Motorola, Inc.	312 576 4446
Michael Fitch	FCC/PRB	202 632 6942
Frank Rose	FCC/DET	202 653 6288
Ted Brenig	G.E.	804 528 7115

1. Introductions & Opening Remarks

Convenor Borman indicated that the Plenary meeting of SG8 would be held in May with Mr. Blaker attending. SG-8A would be reviewing documents for content of interest to this group. Mr. Blaker circulated copies of the Plenary Document (S.8/1422 with attachments PLEN./S-E, with Annex I, II, & III.

Mr. Borman also indicated that the dates for the IWP 8/13 meeting were 27 May to 5 June 1986. A recent communication from Mr. Callendar, Chairman indicated the meeting would be held at Harrison Hot Springs, B.C.

2. Agenda

Mr. Borman indicated that the main subject of this meeting would be a presentation by representatives from Bellcore of a draft document being submitted for consideration for IWP 8/13. He asked that anyone else planning to submit a document, do so as soon as possible. Mr. Blaker pointed out the extremely short cycle for IWP documents. Following U.S. approval they needed to be sent to Geneva for reproduction and distribution to all participating administrations, or at the least be taken in sufficient quantities to the meeting. Mr. Blaker reported that he had been informed that Japan, Norway, Sweden, Costa Rica, and New Zealand planned to participate in IWP 8/13 and expected there would be others in addition to the U.S.

Mr. Borman then turned the floor over to Mr. Porter who gave an overview of the Bellcore organization and the role of their company in serving the Regional Bell Operating Companies.

Mr. Arnold then made a VU-graph presentation of their draft document (assigned U.S.A. 8/13-1 Rev.0) entitled "Report to Interim Working

Party 8/13" and "Future Land Mobile Telecommunications Systems". The report detailed a system to apply radio in the telephone local distribution plant. It was emphasized that it was not considered a replacement for the present U.S. cellular mobile radio system. The objectives of the system would be a universal portable voice-data communication link with the Public Switched Telephone System serving both fixed and mobile users. The document proposed a wide variety of general objectives which would serve as a first step toward more detailed specifications. A highly desirable goal of the system would be interworking whereby the user would be unaware of any national differences. CCIR and CCITT joint participation would be required. Radio would be used to replace wired distribution by means of low-powered base(fixed) stations, or "ports" serving a radius of 2000 ft. each. Each port would employ an antenna of approx. 30 ft. height. Ports would also be employed inside office buildings. Each port would interface with the local serving switching center. Ports would re-use frequencies within an area and transmission to and from the portable subscriber unit would be digital, rather than analog transmission. Portable units would not transmit and receive simultaneously to conserve battery demand, but would still operate on a duplex frequency pair.

Messrs Arnold and Porter answered numerous questions regarding their presentation. Mr. Porter also made available copies of a paper from the IEEE Transactions on Vehicular Technology, Vol.VI-34, No.3, August 1985 entitled "Universal Portable Radio Communications" by Donald C. Cox, Fellow, IEEE. Mr. Porter expressed regrets that Mr. Cox was unable to attend due to the flu. He also pointed out that the first two paragraphs of the document were intended only as an introduction for SG-8A and not intended to go forward as part of the IWP document.

Convenor Borman thanked the Bellcore representatives for their presentation and asked that anyone having comments or corrections to this document contact Mr. Arnold or Mr. Porter promptly so that any corrections or changes could be incorporated prior to the next meeting. He also asked if anyone else anticipated submitting documents. Mr. Zahalka said that GTE might possibly submit a document. Mr. Borman indicated that any document should be submitted prior to the end of April to meet the schedule.

Mr. Borman then asked for approval of the minutes of the last meeting (Doc.8A/1) held on January 13 with one change. He asked that the word "submissions" at the beginning of line 4, page 2 be changed to "recommendations". There being no objection, the minutes were accepted with this change.

3. Next meeting

The next meeting of SG-8A combined with a meeting of IWP 8/13 will be held at the time and place shown below:

DATE: Wednesday, March 19, 1986

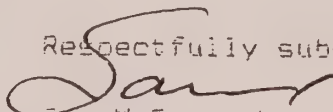
TIME: 9:30 a.m.

PLACE: Conference Room, Motorola, Inc. Suite 300
1776 K St. N.W.
Washington, D.C. 20006

4. Adjournment

The meeting was adjourned at 12:33 p.m.

Respectfully submitted,



Sam McConoughey, Sec'y. c/o F.C.C.

Rm. 257 2000 L St. N.W. Washington, D.C. 20554

ASC X12.A-1985

DRAFT PROPOSED
AMERICAN NATIONAL STANDARD
FOR ELECTRONIC BUSINESS DATA INTERCHANGE
AMATEUR RADIO MESSAGE
TRANSACTION SET

3/01/86 NC4E

SECRETARIAT

Transportation Data Coordinating Committee

ABSTRACT

This standard contains the format and data content of the Amateur Radio Message Transaction Set for use within an Electronic Business Data Interchange (EBDI) environment.

The ASC X12 family of Electronic Business Data Interchange standards are based on interdependency. Several of the ASC X12 standards define the data elements, data segments, control structures and acknowledgments that relate to transaction set standards. Availability of the following standards is required in order to interpret, understand, and use the ASC X12 family of standards.

ANSI/ASC X12.3 Data Element Dictionary

ANSI/ASC X12.22 Data Segment Directory

ANSI/ASC X12.5 Interchange Control Structure

ANSI/ASC X12.6 Application Control Structure

ANSI/ASC X12.20 Functional Acknowledgment (997)

ANSI/ASC X12.21 Interchange Acknowledgment

Information as to the source of the documents noted above can be obtained from:

Secretariat, ASC X12
c/o E. A. Guilbert
TDCC
1101 17th Street NW
Washington, DC. 20036

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A.1. Purpose and Scope	A.1
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A.3.2 Detail Area	A.3.2
A.3.3 Summary Area	A.3.3

APPENDIXES

A.A Appendix A Example Message	A.A
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ASC X12.3-1984 DATA ELEMENT DICTIONARY

3.1. Introduction	3.1
3.2. Data Element Specifications	3.2
(Exerpted from ASC X12.3)	
3.3. Data Element Specifications	3.3
(Proposed additions to ASC X12.3)	

ASC X12.22-1984 DATA SEGMENT DIRECTORY

22.1. Purpose and Scope	22.1
22.2. Data Segment Specifications	22.2
(Exerpted from ASC X12.22)	
22.3. Data Segment Specifications	22.3
(Proposed additions to ASC X12.22)	

AMERICAN NATIONAL STANDARD
FOR ELECTRONIC BUSINESS DATA INTERCHANGE
AMATEUR RADIO MESSAGE TRANSACTION SET

- A.1. Purpose and Scope. This standard provides the standardized format and establishes the data contents of an Amateur Radio Message Transaction Set within the context of an electronic business data interchange (EBDI) environment.
- A.2. Terms and Definitions. The ASC X12 family of Electronic Business Data Interchange standards are based on interdependency. Several of the ASC X12 standards define the data elements, data segments, control structures and acknowledgments that relate to transaction set standards. Availability of the following standards is required in order to interpret, understand, and use the ASC X12 family of standards.

ANSI/ASC X12.3 Data Element Dictionary

ANSI/ASC X12.22 Data Segment Directory

ANSI/ASC X12.5 Interchange Control Structure

ANSI/ASC X12.6 Application Control Structure

ANSI/ASC X12.20 Functional Acknowledgment (997)

ANSI/ASC X12.21 Interchange Acknowledgment

ANSI/ASC X12.6, American National Standard for Electronic Business Data Interchange - Application Control Structure, contains the technical definitions of all terms related to Electronic Business Data Interchange. The definitions below are consistent with those formal definitions and are provided here, in shortened form, to aid in the understanding of this standard.

transaction set. A transaction set is composed of the specific group of data segments which represent a common business document - for example, a purchase order or an invoice. A transaction set is the collection of data that is exchanged in order to convey meaning between the parties engaged in electronic business data interchange. Each transaction set starts with a transaction set header, and is immediately followed by a beginning data segment unique

to that transaction set type. The transaction set is terminated (ended) by a transaction set trailer.

data segment. A data segment is the intermediate unit of information in a transaction set. Data segments consist of logically related data elements in a defined sequence. Data segments have a predefined data segment identifier which comprises the first characters of the data segment. When data segments are combined to form a transaction set their relationship to the transaction set is defined by a requirement designator and a data segment sequence. Some data segments may be repeated, and groups of data segments may be repeated as loop.

data segment identifier. Each data segment has a unique identifier composed of upper case letters and digits with a length of two or three characters. The identifier serves as a name for the data segment and occupies the first character positions of the data segment. The data segment identifier is not a data element.

data segment requirement designator. A data segment has one of three requirement designators defining its need to appear within the transaction set. The requirement designators are listed below with each followed by the code in parentheses.

Mandatory (M). This segment must appear in the transaction set.

Optional (O). The appearance of this segment is at the option of the sending party or may be based on the mutual agreement of the interchange parties.

Floating (F). This designator is used for OPTIONAL data segments that may appear anywhere in the transaction set after the beginning segment and before the transaction set trailer.

data segment sequence. Each data segment has a specific sequence within the transaction set. Data segments must appear in this order, except "F" designated segments, which may appear anywhere within the transaction set, after the beginning segment and before the transaction set trailer. Data segments may appear in any of the three areas of the transaction set, as indicated below.

+ Heading Area. When a data segment appears in this area, it refers to the entire transaction set.

- + Detail Area. When a data segment appears in this area, it refers to that detail information only, and will override any similar specification in the heading area.
- + Summary Area. Data segments in this area contain only control totals or actions performed on those totals, such as overall discounts.

maximum use of segments. Some data segments may be repeated multiple times at their specific location in the transaction set. The term "Maximum Use" in 3.2, 3.3, and 3.4 refers to the maximum number of times a segment is performed to appear, in succession, at that specific location.

loops of data segments. Within transaction sets specific groups of logically related data segments always appear together. These segment groups are referred to as loops. The term "Loop ID/Repeat Count" in 3.2, 3.3, and 3.4 refers to the position and nesting of loops and the number of times each loop is permitted to occur at that specific location in the transaction. One loop may be nested within another loop provided an inner loop terminates before any outer loop terminates.

monetary values. The monetary values that may appear in certain data segments reflect the currency of the country of the transaction set originator unless otherwise specified by the use of the optional "CUR" segment within a transaction set. (The "CUR" segment provides the capability to specify the currency of other countries or to convert the currency of any country to the currency of any other currency).

functional group identifier. Each transaction set is included in a specific collection of similar transaction sets called a functional group, as defined in ANSI/ASC X12.6. The allowable functional identifier for the Amateur Radio Message Transaction Set is "QNU".

A.3. Transaction Set Specifications.

A.3.1 Introduction. The transaction set specifications are presented in 3.2, 3.3, and 3.4. The specifications define the sequence of data segments, the requirement designators, maximum use, and loop ID/repeat counts for each of the three areas of the transaction set. Also included are explanatory comments that relate to the use of certain segments and loops.

A.3.2 HEADING AREA

DATA SEGMENT SEQUENCE FOR THE HEADING AREA AMATEUR RADIO MESSAGE TRANSACTION SET

SEGMENT IDENTIFIER	TITLE	REQUIREMENT DESIGNATOR	MAX USE	LOOP ID/ REPEAT COUNT
ST	Transaction Set Header	M	1	
GNU	Beginning Segment (Amateur Radio Message)	M	1	
QPA	Preamble	M	1	
QAD	Address	M	1	

A.3.2 DETAIL AREA

DATA SEGMENT SEQUENCE FOR THE DETAIL AREA AMATEUR RADIO MESSAGE TRANSACTION SET

SEGMENT IDENTIFIER	TITLE	REQUIREMENT DESIGNATOR	MAX USE	LOOP ID/ REPEAT COUNT
QTX	Text	M	99	
QSG	Signature	M	1	

A.3.4 SUMMARY AREA

DATA SEGMENT SEQUENCE FOR THE SUMMARY AREA AMATEUR RADIO MESSAGE TRANSACTION SET

SEGMENT IDENTIFIER	TITLE	REQUIREMENT DESIGNATOR	MAX USE	LOOP ID/ REPEAT COUNT
SE	Transaction Set Trailer M (End)		1	

APPENDIX (This Appendix is not a part of American
National Standard ANSI/ASC X12.A-1985

A.A Appendix A

Example Amateur Radio Message Transaction

This appendix contains an example of an amateur radio message document that conforms to the requirements of ANSI/ASC X12.A-1985. Figure A1 shows the original radiogram document. Figure A2 shows the data segments that translate those information units to conform to ANSI/ASC X12.A-1985.

The amateur radio message example in Figure A2 does not illustrate the use of all the elements that make up the amateur radio message transaction set, it is only intended to show how a simple radiogram document is encoded to conform to this standard. For more complex documents the use of additional optional elements shown in the data segment diagrams may be required.

* A M A T E U R M E S S A G E F O R M

THE AMERICAN RADIO RELAY LEAGUE R A D I O G R A M via amateur radio							
NUMBER	PRECEDENCE	HX	STATION OF ORIGIN	CHECK	PLACE OF ORIGIN	TIME FILED	DATE
1	R	B24	WIAW	8	NEWINGTON CONN	1830Z	Jul 11
<p>TO</p> <p>DONALD SMITH 164 EAST SIXTH AVE NORTH RIVER CITY MO 00789 733 4968</p> <p>HAPPY BIRTHDAY X SEE YOU SOON X LOVE</p> <p>DIANA</p>							

* A M A T E U R P A C K E T M E S S A G E

ST*ARL*1234↓

QNU*R*0789*1↓

QPA*1*R*HXB24*W1AW*8*NEWINGTON CONN*1830*850701↓

QAD**DONALD SMITH***1645 EAST SIXTH AVE*NORTH R
IVER CITY*MO*00789*US*7334968↓

QTX*HAPPY BIRTHDAY X SEE YOU SOON X LOVE↓

QSG**DIANA*****↓

SE*7*1234↓

3. Data Element Dictionary.

3.1 Introduction. The data element specifications are presented in 3.2. In addition to the specifications and formal definitions, this standard also contains cross-reference information to the appendixes. The data elements are listed in data element reference number sequence in the standard.

Some data elements contain references to either the Appendix A Code Sources or the Appendix B code Lists. These references indicate the appropriate appendix where code lists or code sources used as values for those elements may be found. Code lists and code sources are listed in data element number sequence in Appendixes A and B.

3.2 DATA ELEMENT SPECIFICATIONS
(Excerpted from ASC X12.3)

3 FREE-FORM MESSAGE

(SPEC: TYPE= AN MIN= 1: MAX= 60)
FREE-FORM TEXT.

19 CITY NAME

(SPEC: TYPE= AN MIN= 2: MAX= 19)
FREE-FORM TEXT FOR CITY NAME.

26 COUNTRY CODE

(SPEC: TYPE= ID MIN= 2: MAX= 2)
TWO CHARACTER ISO STANDARD COUNTRY CODE
(SEE APPENDIX A.)

93 NAME

(SPEC: TYPE= AN MIN= 1: MAX= 35)
FREE-FORM ORGANIZATION NAME, OFFICIAL TITLE OR
RELATED INFORMATION.

96 NUMBER OF INCLUDED SEGMENTS

(SPEC: TYPE= NO MIN= 1: MAX= 6)
TOTAL NUMBER OF SEGMENTS INCLUDED IN A TRANS-
ACTION SET INCLUDING ST AND SE SEGMENTS.

116 POSTAL CODE

(SPEC: TYPE= ID MIN= 5: MAX= 9)
INTERNATIONALLY USED POSTAL ZONE CODE EXCLUDING
PUNCTUATION AND BLANKS (ZIP CODE FOR UNITED STATES).

143 TRANSACTION SET IDENTIFIER

(SPEC: TYPE= ID MIN= 3: MAX= 3)
UNIQUE IDENTIFYING NUMBER FOR THE TRANSACTION SET

156 STATE OR PROVINCE CODE

(SPEC: TYPE= ID MIN= 2: MAX= 2)
STANDARD STATE/PROVINCE CODE DEFINED BY
APPROPRIATE GOVERNMENTAL AGENCIES.

166 ADDRESS

(SPEC: TYPE= AN MIN= 1: MAX= 35)
ADDRESS INFORMATION

329 TRANSACTION SET CONTROL NUMBER

(SPEC: TYPE= AN MIN= 4: MAX= 9)
IDENTIFYING CONTROL NUMBER ASSIGNED BY THE ORIGINATOR
FOR A TRANSACTION SET.

337 UTC TIME FILED

(SPEC: TYPE= TM MIN= 4: MAX= 4)
UNIVERSAL TIME OF THE SENDER OF THE TRANSMISSION
SET EXPRESSED IN 24-HOUR CLOCK TIME (HHMM)
(TIME RANGE: 0000 THROUGH 2359)

364 COMMUNICATION NUMBER

(SPEC: TYPE= AN MIN= 7: MAX= 21)
COMPLETE COMMUNICATIONS NUMBER INCLUDING COUNTRY
OR AREA CODE WHEN APPLICABLE.

373 DATE

(SPEC: TYPE= DT MIN= 6: MAX= 6)
DATE (YYMMDD)

3.3 DATA ELEMENT SPECIFICATIONS

(Proposed additions to ASC X12.3)

Q1 PRECEDENCE

(SPEC: TYPE= ID MIN= 1: MAX= 9)
PRECEDENCE (R, W, P OR EMERGENCY)

Q2 DESTINATION STATION OR POSTAL CODE

(SPEC: TYPE= ID MIN= 4: MAX= 10)
IDENTIFIER OF STATION MESSAGE IS TO BE
DELIVERED TO.

Q3 MESSAGE NUMBER

(SPEC: TYPE= NO MIN= 1: MAX= 4)
NUMBER (BEGIN WITH 1 EACH MONTH OR YEAR)

Q4 HANDLING INSTRUCTION

(SPEC: TYPE= ID MIN= 3: MAX= 24)
HANDLING INSTRUCTIONS:

- HXA - (FOLLOWED BY NUMBER.) COLLECT LANDLINE DELIVERY
AUTHORIZED BY ADDRESSEE WITHIN ... MILES. (IF NO
NUMBER, AUTHORIZATION IS UNLIMITED.)
- HXB - (FOLLOWED BY NUMBER.) CANCEL MESSAGE IF NOT
DELIVERED WITHIN ... HOURS OF FILING TIME; SERVICE
ORIGINATING STATION.
- HXC - REPORT DATE AND TIME OF DELIVERY (TOD) TO
ORIGINATING STATION.
- HXD - REPORT TO ORIGINATING STATION THE IDENTITY OF STATION
FROM WHICH RECEIVED, PLUS DATE AND TIME. REPORT IDENTITY
OF STATION TO WHICH RELAYED, PLUS DATE AND TIME, OR IF
DELIVERED REPORT DATE, TIME AND METHOD OF DELIVERY.
- HXE - DELIVERING STATION GET REPLY FROM ADDRESSEE,
ORIGINATE MESSAGE BACK.
- HXF - (FOLLOWED BY NUMBER.) HOLD DELIVERY UNTIL ... (DATE).
- HXG - DELIVERY BY MAIL OR LANDLINE TOLL CALL NOT REQUIRED.
IF TOLL OR OTHER EXPENSE INVOLVED, CANCEL MESSAGE AND
SERVICE ORIGINATING STATION.

Q5 STATION OF ORIGIN

(SPEC: TYPE= ID MIN= 4: MAX= 10)
FIRST AMATEUR HANDLER.

Q6 CHECK

(SPEC: TYPE= NO MIN= 1: MAX= 4)
NUMBER OF WORDS/GROUPS IN TEXT ONLY.

Q7 PLACE OF ORIGIN

(SPEC: TYPE= AN MIN= 2: MAX= 25)
NOT NECESSARILY LOCATION OF STATION OF ORIGIN.

Q8 RADIO CALLSIGN

(SPEC: TYPE= AN MIN= 4: MAX= 10)
AMATEUR RADIO CALLSIGN.

22.3.2 DATA SEGMENT DIAGRAMS
(Excerpted from ASC X12.22)

STANDARD REQUIREMENTS

ST TRANSACTION SET HEADER

PURPOSE: THE FIRST SEGMENT OF EACH TRANSACTION SET, CONTAINING THE TRANSACTION SET IDENTIFIER AND CONTROL NUMBER.

DIAGRAM:

				NOTE 1	
ST	*	ST01 143 TRANSACTION SET ID	*	ST02 329 TRANS. SET CONTROL NO.	N L
		M ID 03/03		M AN 04/09	

NOTE: 1. THE "TRANSACTION SET CONTROL NUMBER" ENTRY IN THIS HEADER MUST MATCH THE "TRANSACTION SET CONTROL NUMBER" ENTRY IN THE TRANSACTION SET TRAILER (SE).

THE TRANSACTION SET IDENTIFIER (ST01) IS INTENDED FOR USE BY THE TRANSLATION ROUTINES OF THE INTERCHANGE PARTNERS TO SELECT THE APPROPRIATE TRANSACTION SET DEFINITION (e.g., 810, SELECTS THE INVOICE TRANSACTION SET).

STANDARD REQUIREMENTS

SE TRANSACTION SET TRAILER (END)

PURPOSE: THE LAST SEGMENT OF EACH TRANSACTION SET, CONTAINING THE NUMBER OF INCLUDED SEGMENTS AND TRANSACTION SET CONTROL NUMBER.

DIAGRAM:

		NOTE 1			NOTE 2
SE	*	SE01 96 NUMBER OF INCLUDED SEG.	*	SE02 329 TRANS. SET CONTROL NO.	N L
		M NO 01/06		M AN 04/09	

NOTES: 1. THE "NUMBER OF INCLUDED SEGMENTS" IS THE TOTAL OF ALL SEGMENTS USED IN THE TRANSACTION SET INCLUDING THE (ST) AND (SE) SEGMENTS.

NOTES: 2. THE TRANSACTION SET CONTROL NUMBER VALUE IN THIS TRAILER MUST MATCH THE SAME ELEMENT VALUE IN THE TRANSACTION SET HEADER (ST).SEGMENTS.

SE IMMEDIATELY FOLLOWS THE LAST SEGMENT OF EACH TRANSACTION SET.

22.3.2 DATA SEGMENT DIAGRAMS
(Proposed additions to ASC X12.22)

STANDARD REQUIREMENTS

QNU AMATEUR RADIO PACKET MESSAGE HEADER

PURPOSE: THIS IS USED TO START AN AMATEUR RADIO MESSAGE TRANSACTION SET.

DIAGRAM:

QNU	*	QNU01 Q1 PRECEDENCE	*	QNU02 Q2 DESTINATION STATION OR POSTAL CODE	*	QNU03 Q3 MESSAGE NUMBER	N L
		M ID 01/09		M ID 04/10		M NO 01/04	

STANDARD REQUIREMENTS

QNP A AMATEUR RADIO PACKET MESSAGE PREAMBLE

PURPOSE: THIS IS USED TO DEFINE AN AMATEUR RADIO MESSAGE PREAMBLE SECTION.

DIAGRAM:

QPA	*	QPA01 Q3 MESSAGE NUMBER	*	QPA02 Q1 PRECEDENCE	*	QPA03 Q4 HANDLING INSTRUCTION	*
		M NO 01/04		M ID 01/09		O ID 03/24	

QPA04 Q5 STATION OF ORIGIN	*	QPA05 Q6 CHECK	*	QPA06 Q7 PLACE OF ORIGIN	*
M ID 04/10		M NO 01/04		M AN 02/25	

QPA07 337 UTC TIME FILED	*	QPA08 373 DATE FILED	N L
M TM 04/04		M DT 06/06	

STANDARD REQUIREMENTS

QAD AMATEUR RADIO PACKET MESSAGE ADDRESS

PURPOSE: THIS IS USED TO DEFINE AN AMATEUR RADIO MESSAGE ADDRESS SECTION.

DIAGRAM:

QAD	*	QAD01 08 RADIO CALLSIGN	*	QAD02 93 NAME	*	QAD03 93 TITLE	*
		O AN 04/10		M AN 01/35		O AN 01/35	

QAD04 93 ORGANIZAT- ION	*	QAD05 166 STREET ADDRESS	*	QAD06 19 CITY NAME	*
C AN 01/35		O AN 01/35		M AN 02/19	

QAD07 156 STATE/PROV CODE	*	QAD08 116 ZIP/POSTAL CODE	*	QAD09 26 COUNTRY CODE	*
M ID 02/02		M ID 05/09		M ID 02/02	

QAD10 364 COMM. NUMBER	N L
M AN 07/21	

STANDARD REQUIREMENTS

RTX AMATEUR RADIO PACKET MESSAGE TEXT

PURPOSE: THIS IS USED TO DEFINE AN AMATEUR RADIO MESSAGE
TEXT SECTION.

DIAGRAM:

QTX	*	QTX01 FREE-FORM MESSAGE M AN 01/60	3 N L
-----	---	---	-----------------

STANDARD REQUIREMENTS

QSG AMATEUR RADIO PACKET MESSAGE SIGNATURE

PURPOSE: THIS IS USED TO DEFINE AN AMATEUR RADIO MESSAGE SIGNATURE SECTION.

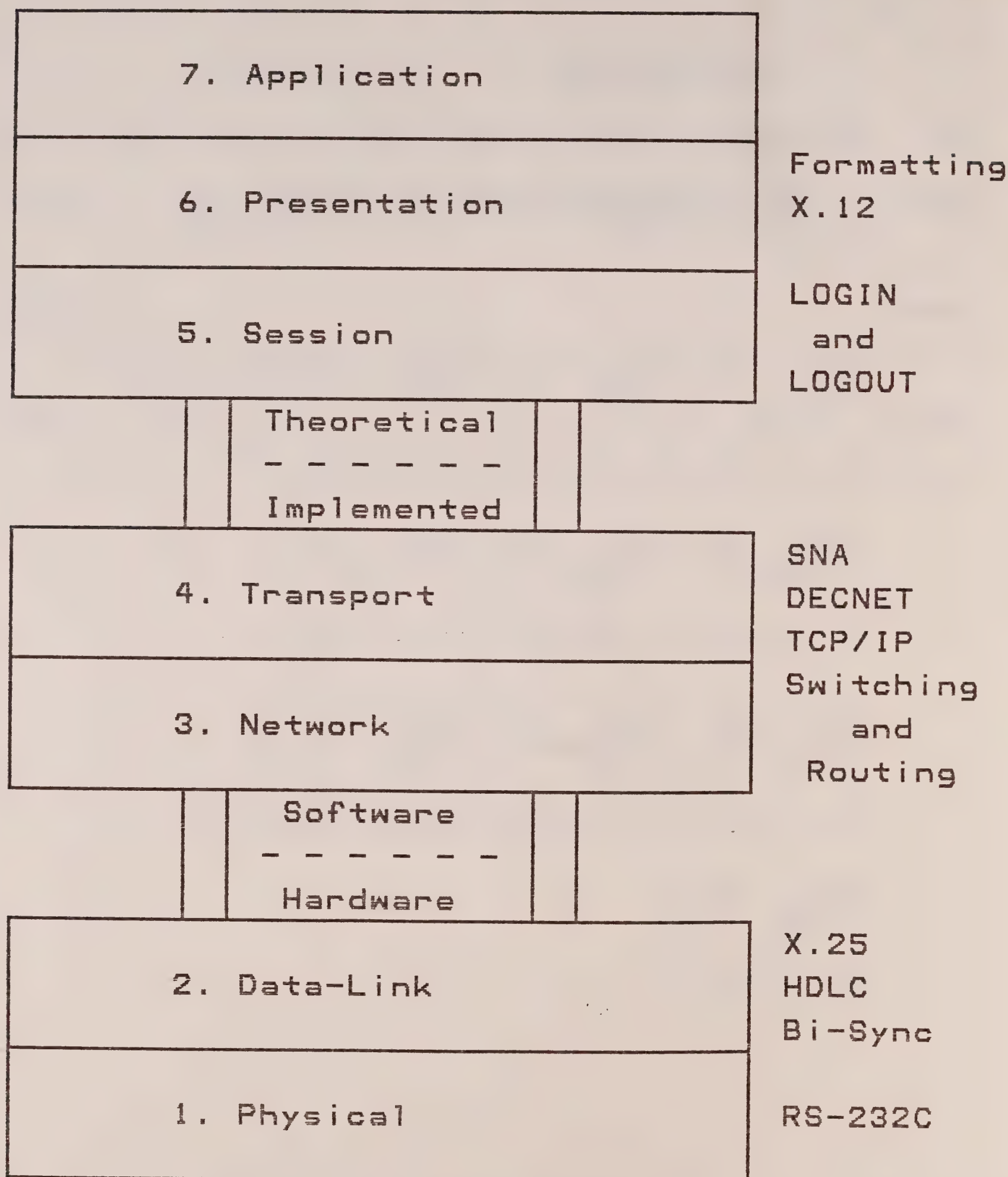
DIAGRAM:

QSG	*	QSG01 08 RADIO CALLSIGN	*	QSG02 93 NAME	*	QSG03 93 TITLE	*
		0 AN 04/10		M AN 01/35		0 AN 01/35	

QSG04 93 ORGANIZAT- ION	*	QSG05 166 STREET ADDRESS	*	QSG06 19 CITY NAME	*
C AN 01/35		0 AN 01/35		0 AN 02/19	

QSG07 156 STATE/PROV CODE	*	QSG08 116 ZIP/POSTAL CODE	*	QSG09 26 COUNTRY CODE	*
0 ID 02/02		0 ID 05/09		0 ID 02/02	

QSG10 364 COMM. NUMBER	N L
0 AN 07/21	



The OSI Seven-layer model.

The International Standards Organization's Open System Interconnection (OSI) model divides local area network architecture into seven layers. Each layer in the model is defined and provides rules for network design. Viewed another way, the bottom four layers define the network and how it functions. The top three layers define how the network is used.

* A M A T E U R M E S S A G E F O R M

THE AMERICAN RADIO RELAY LEAGUE R A D I O G R A M via amateur radio							
NUMBER	PRECEDENCE	HX	STATION OF ORIGIN	CHECK	PLACE OF ORIGIN	TIME FILED	DATE
1	R	B24	WIAW	8	NEWINGTON CONN	1830Z	JUL11
<p>TO</p> <p>DONALD SMITH 164 EAST SIXTH AVE NORTH RIVER CITY MO 00789 733 4968</p> <p>HAPPY BIRTHDAY X SEE YOU SOON X LOVE</p> <p>DIANA</p>							

* A M A T E U R P A C K E T M E S S A G E

ST*ARL*1234↵

QNU*R*00789*1↵

QPA*1*R*HXB24*W1AW*8*NEWINGTON CONN*1830*850701↵

QAD**DONALD SMITH***1645 EAST SIXTH AVE*NORTH R
IVER CITY*MO*00789*US*7334968↵

QTX*HAPPY BIRTHDAY X SEE YOU SOON X LOVE↵

QSG**DIANA*****↵

SE*7*1234↵

		NOTE 1			
ST	*	ST01 143 TRANSACTION SET ID	*	ST02 329 TRANS. SET CONTROL NO.	N L
		M ID 03/03		M AN 04/09	

NOTE: 1. THE "TRANSACTION SET CONTROL NUMBER" ENTRY IN THIS HEADER MUST MATCH THE "TRANSACTION SET CONTROL NUMBER" ENTRY IN THE TRANSACTION SET TRAILER (SE).

THE TRANSACTION SET IDENTIFIER (ST01) IS INTENDED FOR USE BY THE TRANSLATION ROUTINES OF THE INTERCHANGE PARTNERS TO SELECT THE APPROPRIATE TRANSACTION SET DEFINITION (e.g., 810, SELECTS THE INVOICE TRANSACTION SET).

		NOTE 1		NOTE 2	
SE	*	SE01 96 NUMBER OF INCLUDED SEG.	*	SE02 329 TRANS. SET CONTROL NO.	N L
		M NO 01/06		M AN 04/09	

NOTES: 1. THE "NUMBER OF INCLUDED SEGMENTS" IS THE TOTAL OF ALL SEGMENTS USED IN THE TRANSACTION SET INCLUDING THE (ST) AND (SE) SEGMENTS.

NOTES: 2. THE TRANSACTION SET CONTROL NUMBER VALUE IN THIS TRAILER MUST MATCH THE SAME ELEMENT VALUE IN THE TRANSACTION SET HEADER (ST).SEGMENTS.

SE IMMEDIATELY FOLLOWS THE LAST SEGMENT OF EACH TRANSACTION SET.

* A M A T E U R M E S S A G E F O R M

THE AMERICAN RADIO RELAY LEAGUE
R A D I O G R A M
via amateur radio

NUMBER 1	PRECEDENCE R	HX B24	STATION OF ORIGIN WIAW	CHECK 8	PLACE OF ORIGIN NEWINGTON CONN	TIME FILED 1830Z	DATE Jul 11
-------------	-----------------	-----------	---------------------------	------------	-----------------------------------	---------------------	----------------

TO
DONALD SMITH
164 EAST SIXTH AVE
NORTH RIVER CITY MO 00789
733 4968

HAPPY BIRTHDAY X SEE YOU SOON X LOVE

DIANA

* A M A T E U R P A C K E T M E S S A G E

ST*ARL*1234↓

QNU*R*00789*1↓

QPA*1*R*HXB24*W1AW*8*NEWINGTON CONN*1830*850701↓

QAD**DONALD SMITH***1645 EAST SIXTH AVE*NORTH R
IVER CITY*MO*00789*US*7334968↓

QTX*HAPPY BIRTHDAY X SEE YOU SOON X LOVE↓

QSG**DIANA*****↓

SE*7*1234↓

QNU	*	QNU01 Q1 PRECEDENCE	*	QNU02 Q2 DESTINATION STATION OR POSTAL CODE	*	QNU03 Q3 MESSAGE NUMBER	N L
		M ID 01/09		M ID 04/10		M NO 01/04	

QPA	*	QPA01 Q3 MESSAGE NUMBER	*	QPA02 Q1 PRECEDENCE	*	QPA03 Q4 HANDLING INSTRUCTION	*
		M NO 01/04		M ID 01/09		O ID 03/24	

QPA04 Q5 STATION OF ORIGIN	*	QPA05 Q6 CHECK	*	QPA06 Q7 PLACE OF ORIGIN	*
M ID 04/10		M NO 01/04		M AN 02/25	

QPA07 337 UTC TIME FILED	*	QPA08 373 DATE FILED	N L
M TM 04/04		M DT 06/06	

QAD	*	QAD01 Q8 RADIO CALLSIGN	*	QAD02 93 NAME	*	QAD03 93 TITLE	*
		O AN 04/10		M AN 01/35		O AN 01/35	

QAD04 93 ORGANIZAT- ION	*	QAD05 166 STREET ADDRESS	*	QAD06 19 CITY NAME	*
C AN 01/35		O AN 01/35		M AN 02/19	

QAD07 156 STATE/PROV CODE	*	QAD08 116 ZIP/POSTAL CODE	*	QAD09 26 COUNTRY CODE	*
M ID 02/02		M ID 05/09		M ID 02/02	

QAD10 364 COMM. NUMBER	N L
M AN 07/21	

QTX	*	QTX01 3 FREE-FORM MESSAGE	N L
		M AN 01/60	

QSG	*	QSG01 98 RADIO CALLSIGN	*	QSG02 93 NAME	*	QSG03 93 TITLE	*
		O AN 04/10		M AN 01/35		O AN 01/35	

QSG04 93 ORGANIZAT- ION	*	QSG05 166 STREET ADDRESS	*	QSG06 19 CITY NAME	*
C AN 01/35		O AN 01/35		O AN 02/19	

QSG07 156 STATE/PROV CODE	*	QSG08 116 ZIP/POSTAL CODE	*	QSG09 26 COUNTRY CODE	*
O ID 02/02		O ID 05/09		O ID 02/02	

QSG10 364 COMM. NUMBER	N L
O AN 07/21	

Doc. 8A/8
1986-1997

200 MAY -6 10:00

MINUTES OF MEETING

U.S. COIR Ad Hoc Study Group 8A-Land Mobile
Held on February 21, 1986
At the Motorola, Inc. Conference Room
Suite 300 1776 K St. N.W.
Washington, D.C. 20006

Convenor Mr. Borman called the meeting to order at 9:30 a.m. with the following persons in attendance:

NAME	AFFILIATION	TELEPHONE
Mr. Borman, Convenor	Motorola, Inc.	202 862 1500
Sam McConoughey, Sec'y.	FCC	202 632 7502
H.W. (Pete) Arnold	Bellcore	201 758 2982
H. T. Blaker, U.S. Chmn. SG-8	Rockwell Int'l.	703 553 6687
L. D. Reed	FCC/PRB	202 632 7175
W. J. Riordan	AT&T Bell Labs	201 870 7849
C. E. Rice	Bellcore	201 740 4567
P. T. Porter	Bellcore	201 758 2983
Lee Zahalka	GTE Labs	617 466 2397
Jim Mikulski	Motorola, Inc.	312 576 4446
Michael Fitch	FCC/PRB	202 632 6942
Frank Rose	FCC/DET	202 653 6288
Ted Brenig	G.E.	804 528 7115

1. Introductions & Opening Remarks

Convenor Borman indicated that the Plenary meeting of SG8 would be held in May with Mr. Blaker attending. SG-8A would be reviewing documents for content of interest to this group. Mr. Blaker circulated copies of the Plenary Document (S.8/1422 with attachments PLEN./S-E, with Annex I, II, & III.

Mr. Borman also indicated that the dates for the IWP 8/13 meeting were 27 May to 5 June 1986. A recent communication from Mr. Callendar, Chairman indicated the meeting would be held at Harrison Hot Springs, B.C.

2. Agenda

Mr. Borman indicated that the main subject of this meeting would be a presentation by representatives from Bellcore of a draft document being submitted for consideration for IWP 8/13. He asked that anyone else planning to submit a document, do so as soon as possible. Mr. Blaker pointed out the extremely short cycle for IWP documents. Following U.S. approval they needed to be sent to Geneva for reproduction and distribution to all participating administrations, or at the least be taken in sufficient quantities to the meeting. Mr. Blaker reported that he had been informed that Japan, Norway, Sweden, Costa Rica, and New Zealand planned to participate in IWP 8/13 and expected there would be others in addition to the U.S.

Mr. Borman then turned the floor over to Mr. Porter who gave an overview of the Bellcore organization and the role of their company in serving the Regional Bell Operating Companies.

Mr. Arnold then made a VU-graph presentation of their draft document (assigned U.S.A. 8/13-1 Rev.0) entitled "Report to Interim Working

Party 8/13" and "Future Land Mobile Telecommunications Systems". The report detailed a system to apply radio in the telephone local distribution plant. It was emphasized that it was not considered a replacement for the present U.S. cellular mobile radio system. The objectives of the system would be a universal, portable voice/data communication link with the Public Switched Telephone System serving both fixed and mobile users. The document proposed a wide variety of general objectives which would serve as a first step toward more detailed specifications. A highly desirable goal of the system would be interworking whereby the user would be unaware of any national differences. CCIR and CCITT joint participation would be required. Radio would be used to replace wired distribution by means of low-powered base(fixed) stations, or "ports" serving a radius of 2000 ft. each. Each port would employ an antenna of approx. 30 ft. height. Ports would also be employed inside office buildings. Each port would interface with the local serving switching center. Ports would re-use frequencies within an area and transmission to and from the portable subscriber unit would be digital, rather than analog transmission. Portable units would not transmit and receive simultaneously to conserve battery demand, but would still operate on a duplex frequency pair.

Messrs Arnold and Porter answered numerous questions regarding their presentation. Mr. Porter also made available copies of a paper from the IEEE Transactions on Vehicular Technology, Vol.VI-34, No.3, August 1985 entitled "Universal Portable Radio Communications" by Donald C. Cox, Fellow, IEEE. Mr. Porter expressed regrets that Mr. Cox was unable to attend due to the flu. He also pointed out that the first two paragraphs of the document were intended only as an introduction for SG-8A and not intended to go forward as part of the IWP document.

Convenor Borman thanked the Bellcore representatives for their presentation and asked that anyone having comments or corrections to this document contact Mr. Arnold or Mr. Porter promptly so that any corrections or changes could be incorporated prior to the next meeting. He also asked if anyone else anticipated submitting documents. Mr. Zahalka said that GTE might possibly submit a document. Mr. Borman indicated that any document should be submitted prior to the end of April to meet the schedule.

Mr. Borman then asked for approval of the minutes of the last meeting (Doc.8A/1) held on January 13 with one change. He asked that the word "submissions" at the beginning of line 4, page 2 be changed to "recommendations". There being no objection, the minutes were accepted with this change.

3. Next meeting

The next meeting of SG-8A combined with a meeting of IWP 8/13 will be held at the time and place shown below:

DATE: Wednesday, March 19, 1986

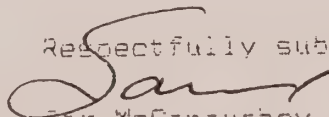
TIME: 9:30 a.m.

PLACE: Conference Room, Motorola, Inc. Suite 320
1776 K St. N.W.
Washington, D.C. 20006

4. Adjournment

The meeting was adjourned at 12:33 p.m.

Respectfully submitted,



Sam McConoughey, Sec'y. c/o F.C.C.
Rm.257 2000 L St.N.W. Washington, D.C. 20554

Network Working Group
Request for Comments: 980

Ole Jacobsen (SRI)
Jon Postel (ISI)
March 1986

Protocol Document Order Information

STATUS OF THIS MEMO

This RFC indicates how to obtain various protocol documents used in the DARPA research community. Included is an overview of the new 1985 DDN Protocol Handbook and available sources for obtaining related documents (such as, DoD, ISO, and CCITT). Distribution of this memo is unlimited.

DOD INTERNET PROTOCOL DOCUMENTS:

How to get the Requests for Comments (RFCs):

RFCs are the working memos of the DARPA research community. The subjects may include protocol specifications, interface definitions, program descriptions, policy statements, trouble reports, algorithms, announcements, and humor. These may range from wild ideas and crazy suggestions, to firm specifications.

The normal method for distribution of RFCs is for interested parties to copy the documents from the DDN Network Information Center's (NIC) online library using FTP. Public access files may be copied from the RFC directory on the SRI-NIC.ARPA host computer via FTP with username ANONYMOUS and password GUEST. The pathname of RFC nnn is RFC:RFCnnn.TXT.

Requests for special distribution should be addressed to either the author of the RFC in question or to NIC@SRI-NIC.ARPA. Unless specifically noted otherwise on the RFC itself, all RFCs are for unlimited distribution.

For hardcopy distribution from the NIC there is a charge of \$5 for each RFC that is less than 100 pages, and \$10 for each RFC that is 100 pages or more to cover the cost of postage and handling (check, money order, or purchase order accepted).

Order From:

SRI International (SRI-NIC)
DDN Network Information Center
Room EJ291
333 Ravenswood Avenue
Menlo Park, CA 94025
Phone: 1-415-859-3695
1-800-235-3155

How to get the Protocol Handbook - 1985:

It has been about 5 years since the release of the Internet Protocol Transition Workbook (IPTW) and the related documents which were issued as a document set for implementors of TCP/IP and related application protocols. These were issued to assist the NCP-to-TCP transition which took place in early 1983. Since that time the network has undergone many changes, the most notable being the creation of the Defense Data Network (DDN) and the ARPANET/MILNET split, leaving the ARPANET as a research and development network, and MILNET as an operational military network.

An updated and much expanded version of the IPTW is needed to reflect these changes, and the 1985 DDN Protocol Handbook is a response to this need. The cost is \$110 domestic, and \$130 foreign, including 4th class postage (check, money order, or purchase order accepted).

The 1985 DDN Protocol Handbook is divided into three volumes:

1. The first volume includes Military Standard (MIL STD) protocols as well as administrative guidelines pertaining to the MILNET portion of the DDN.
2. The second volume includes the DARPA Internet protocols as well as administrative guidelines pertaining to the ARPANET portion of the DDN. Most of these protocols have also been issued as RFCs.
3. The third volume contains several background articles, implementation guidelines, and additional protocol specifications. This volume is relevant to both portions of the network, and should be used in conjunction with the other two volumes.

The Table of Contents of the three volumes is given in Appendix A.

Order From:

SRI International (SRI-NIC)
DDN Network Information Center
Room EJ291
333 Ravenswood Avenue
Menlo Park, CA 94025
Phone: 1-415-859-3695
1-800-235-3155

How to get the Old Protocol Workbook - 1982:

The 1982 edition of the Protocol Handbook is a five volume set. These documents were distributed in hardcopy by the NIC, but are now out of print. Many of the protocols are also RFCs which are available online or in hardcopy from the NIC. The complete documents may be obtained from the National Technical Information Service (NTIS), or the Defense Technical Information Service (DTIC). The documents and their NTIS order numbers are:

Internet Protocol Transition Workbook (IPTW)	ADA153607
Internet Protocol Implementation Guide (IPIG)	ADA153624
Internet Mail Protocol	ADA153625
Internet Telnet Protocol and Options	not deposited
Miscellaneous Protocol	not deposited

Order From:

National Technical Information Service (NTIS)
5285 Port Royal Road
Springfield, VA 22161
Phone: 1-703-487-4650 (order desk)

Or

Defense Technical Information Center (DTIC)
Cameron Station, Bldg. 5
Alexandria, VA 22314
Phone: 1-703-274-7633

How to get the MIL STD Internet Protocol Documents:

Several of the Internet protocol documents have been issued as military standards (MIL-STDs). The MIL-STDs listed below are the official DoD versions of these communication protocols and should be consulted for any implementations. These documents are available from the Naval Publications and Forms Center. Requests can be initiated by telephone, telegraph, or mail; however, it is preferred that private industry use form DD1425, if possible. These five documents are included in the 1985 DDN Protocol Handbook.

Internet Protocol (IP)	MIL-STD-1777
Transmission Control Protocol (TCP)	MIL-STD-1778
File Transfer Protocol (FTP)	MIL-STD-1780
Simple Mail Transfer Protocol (SMTP)	MIL-STD-1781
Telnet Protocol and Options (TELNET)	MIL-STD-1782

Order From:

Naval Publications and Forms Center, Code 3015
5801 Tabor Ave
Philadelphia, PA 19120
Phone: 1-215-697-3321 (order tape)
1-215-697-4834 (conversation)

There may also be brokers in your area that will handle orders for MIL-STDs. One such vendor for MIL-STD documents is Global Engineering.

Relationship between the RFC versions and the MIL STD versions:

The ARPA community specifications for IP (RFC-791) and TCP (RFC-793) and the DoD specifications above are intended to describe exactly the same protocols. Any difference in the protocols specified by these sets of documents should be reported to DCA and to DARPA. The RFCs and the MIL-STDs for IP and TCP differ in style and level of detail. It is strongly advised that the two sets of documents be used together. The ARPA and the DoD specifications for the FTP, SMTP, and Telnet protocols are essentially the same documents (RFCs 765, 821, 854). Note that the current ARPA specification for FTP is RFC-959. The MIL-STD versions have been edited slightly. Implementers should also check the "Official Protocols" memo for comments on protocol status or pending changes (RFC-961). DDN implementators should

watch for DDN Management Bulletins (available from the NIC) which may announce policy changes with respect to the status of protocols on the DDN.

OTHER PROTOCOL DOCUMENTS

ISO Protocol Documents:

Approved ISO standards, and ISO draft standards at either the DP or DIS level, are available from the American National Standards Institute (ANSI) in New York.

Order From:

American National Standards Institute
1430 Broadway
New York, NY 10018
Phone: 1-212-642-4900

There may also be brokers in your area that will handle orders for ISO documents. One such vendor of ISO documents is OMNICON.

CCITT Protocol Documents:

The approved CCITT Recommendations are published by the International Telecommunications Union (ITU) in Geneva.

Order From:

United Nations Bookstore
Room GA.32B
New York, NY 10017

Most of the Red book (1984) is available, including all but one of the X series. The useful volumes are:

VIII.1	V Series	\$43.20
VIII.2	X.1 - X.15	8.60
VIII.3	X.20 - X.32	44.30
VIII.4	X.40 - X.181	46.40
VIII.5	X.200 - X.250	50.80
VIII.6	X.300 - X.353	10.80
VIII.7	X.400 - X.430	not available yet

No shipping charge for over 5 books via UPS. First Class \$1.00 per book. Check with order only.

All the ISO protocols are in the X.200 to X.430 area.

There may also be brokers in your area that will handle orders for ISO documents. One such vendor of CCITT documents is OMNICOM.

NRC Report

The National Research Council's Report to the Department of Defense and the National Bureau of Standards entitled "Transport Protocols for Department of Defense Data Networks".

This was originally published by the National Academy Press, February 1985. The Executive Summary is RFC-939. The complete report is RFC-942.

DOCUMENT BROKERS

We list here some document brokers as a convenience. There may be other brokers that should be listed, if so please let us know and they will be listed in future editions.

Global Engineering:

Global Engineering Documents
2625 Hickory Street
Santa Ana, CA 92707
Phone: 1-800-854-7179

OMNICOM:

OMNICOM, Inc.
501 Church Street, NE
Suite 206
Vienna, VA 22180
Phone: 1-703-281-1135

APPENDIX A

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- 2.5 Position of DoD on Use of National and International Standards

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6.7	Host Front End Protocol (Undergoing Review Process)		[RFC929]
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2.2.1	DARPA/IPTO	
2.3	The Catenet Model for Internetworking	[IEN 48]
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3.1	Request for Comments (RFCs)
3.2	Special Interest Group Discussions
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RFC 980
Protocol Document Order Information

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| 3.17 | Address Resolution Protocol | (ARP) [RFC 826] |
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3.21	CSNET Mailbox Name Server Protocol	(CSNET-NS)	[CS-DN-2]
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PK
[AMENDED AND APPROVED MARCH 22, 1986]

Minutes of Executive Committee
No. 421
Hartford, Connecticut
January 23, 1986

Agenda

1. Determination of date and place of next meeting
2. Consideration of correspondence concerning 1986 Northwestern Division Convention

The Executive Committee of the American Radio Relay League, Inc., met at 9:00 p.m. Eastern Standard Time, Thursday, January 23, 1986, at the Parkview Hilton Hotel, Hartford, Connecticut. Present were President Larry E. Price, W4RA, in the Chair; Directors Frank M. Butler, Jr., W4RH; Paul Grauer, WØFIR; Hugh A. Turnbull, W3ABC; George S. Wilson, III, W4OYI; and Executive Vice President David Sumner, K1ZZ. Also present were Vice President Jay A. Holladay, W6EJJ; Past Director William J. Stevens, W6ZM; Directors Edmond A. Metzger, W9PRN, Tod Olson, KØTO, Lys J. Carey, KØPGM, Linda S. Ferdinand, N2YL, Mary E. Lewis, W7QGP, and Rodney J. Stafford, KB6ZV; and Counsel Christopher D. Imlay, N3AKD.

1) It was agreed to reschedule the next regular meeting of the Executive Committee to Saturday, March 22, 1986, in Charlotte, North Carolina.

2) Recent correspondence concerning the approval of a Northwestern Division Convention to be held May 30 - 31 and June 1, 1986, was reviewed. On motion of Mr. Wilson, the President unanimously was instructed to write the sponsors of a proposed event in Seaside, Oregon advising them that the Committee had discussed their concerns with the Division Director and that she had indicated she would consider favorably an application for state convention sanction for their events; and further, that in view of the incorrect dates for the Northwestern Division Convention that appeared in January QST, the sponsors are to be advised that if they apply for state convention sanction, a ¼-page advertisement in one issue of QST will be provided to them at no charge.

There being no further business, the meeting was adjourned at 10:00 p.m.

Respectfully submitted,



David Sumner, K1ZZ
Recording Secretary

MINUTES OF EXECUTIVE COMMITTEE

No. 422

Charlotte, North Carolina

March 22, 1986

AGENDA

1. Approval of Minutes of the December 14, 1985 and January 23, 1986 Meetings.

2. FCC Matters:

2.1. Review of amended draft petition for rules requiring the labelling of home entertainment equipment with respect to its immunity from radio frequency interference.

2.2. Consideration of an ARRL position regarding PR Docket 86-63, to provide for examination credit for written examination elements above the Novice Class.

2.3. Consideration of Minute 103, 1986 Annual Meeting regarding the callsign formulation to be used by reciprocal operators.

2.4. Consideration of an ARRL position toward FCC's legislative requests.

2.5. Consideration of ARRL position toward late-filed reply comments of Don Stoner, W6TNS, in RM-5241, Proposal for a Public Digital Radio Service.

3. Local antenna/RFI matters.

4. Review of progress on Board directives:

4.1. By the President, regarding Minute 53, 1986 Annual Meeting, with respect to PR Docket 85-105, automatic control of digital repeater stations.

4.2 By the vice presidents, for the standing committees.

4.3. By the Executive Vice President, on Board directives affecting Headquarters.

4.4. By the Executive Vice President, with respect to the possibility of the ARRL assisting the FCC with the issuance of some call signs.

5. Studies requested of the Executive Committee by the Board at its 1986 Annual Meeting:

5.1. From Minute 80, review of the terms and conditions governing the availability of mailing lists from Headquarters.

5.2 From Minute 57, review of the policies and guidelines governing the conduct of Section Managers.

6. Report by the President on the coming IARU Region 2 Triennial Conference.

7. Recognition of new Life Members.
8. Affiliation of clubs.
9. Convention matters:
 - 9.1 Approval of division, state, and section conventions.
 - 9.2 National Convention matters.
10. Authorization to open account at Andover Savings Bank, and for Paul Rinaldo to sign checks on behalf of the Executive Vice President.
11. Date and place of next meeting.
12. Other business.

- . . . -

Pursuant to due notice, the Executive Committee of the American Radio Relay League met at 8:30 A.M. Eastern Standard Time, Saturday, March 22, 1986, at the Marriott City Center Hotel, Charlotte, North Carolina. Present were President Larry E. Price, W4RA, in the Chair; First Vice President Jay A. Holladay, W6EJJ; Executive Vice President David Sumner, K1ZZ; and Directors Frank M. Butler, Jr., W4RH, Paul Grauer, WØFIR, Hugh A. Turnbull, W3ABC, and George S. Wilson III, W4OYI. Also present were Vice Presidents Leonard M. Nathanson, W8RC and William J. Stevens, W6ZM; Secretary Perry Williams, W1UED; Director Clyde O. Hurlbert, W5CH; Vice Director John C. Kanode, N4MM; and Counsel Christopher D. Imlay, N3AKD.

1. Approval of Minutes of previous Executive Committee meetings: Corrections in certain ARRL titles were made to the Minutes of the January 23, 1986 EC meeting. Whereupon, on motion of Mr. Turnbull, the Minutes of the December 14, 1985 and January 23, 1986 meetings were accepted as printed and as amended, respectively.

2. FCC Matters:

2.1. Next, the Committee made minor changes to the draft petition for rulemaking which asks FCC to require labelling of home electronic devices as to measures taken to improve the devices' immunity to radio frequency energy. On motion of Mr. Grauer, it was voted to file the document as amended with the Secretary, Federal Communications Commission.

2.2. On motion of Mr. Butler, Counsel was directed to file comments on behalf of the ARRL in support of the rulemaking proposed in PR Docket 86-63, which would allow credit for any examination elements successfully passed, whether or not a new license was issued as a result. The comments will urge the Commission to require a standard certificate of completion valid for one year only; to require each applicant to file a Form 610 each time because the form provides a sworn statement as to the accuracy of the facts presented therein; to affirm that the examinee bears full responsibility for the

safeguarding of the Certificate until it is accepted by a Volunteer Examiner team to complete requirements for an amateur license; and to require that all certificates of completion furnished to a volunteer examiner team be dated within a year of the time they are submitted for final credit. The Comments will carry the League's recommendation that the VEC not be required to retain Forms 610 of applicants who fell short of completing the requirements for a license class; instead, these Forms 610 could be returned to the applicants.

During the course of the above, the Committee stood in recess briefly, at 9:15 A.M. Roanoke Division Director Gay E. Milius, Jr., W4UG, introduced North Carolina Section Manager Rae Everhart, K4SWN, who welcomed the Committee to the Section and to the Charlotte Hamfest and Computer Fair, in progress at the nearby Convention Center. (Applause) Messrs. Milius and Everhart departed at 9:17, and the meeting resumed.

2.3. Next came consideration of Minute 103, 1986 Annual Meeting, which directed that a petition be filed with the FCC, requesting that call sign formulation for stations operating in the U.S. on a reciprocal basis show the host country first followed by the station call sign (e.g., W1/G2BVN instead of the present G2BVN/W1). The President reported that call sign formulation was embedded in the Canada/U.S. treaty. The consensus was that all visitors must be treated alike; the staff and counsel were directed to move toward fulfillment of the motion with deliberate speed, taking into account the need for changes in the Canadian/U.S. treaty as a prerequisite.

2.4. The Committee then considered the legislative requests of the FCC to Congress.

2.4.1. On motion of Mr. Wilson, the ARRL urges the Congress and the FCC to preserve the Conflict of Interest statute and regulations with respect to Volunteer Examiner Coordinators in fulfillment of Section 154(f)(4)(A), Communications Act of 1934 as amended ("The Act").

2.4.2. On motion of Mr. Butler, the ARRL urges the Congress and the FCC to preserve the reporting and record-keeping requirements for volunteer examiners and volunteer examiner coordinators in fulfillment of present Section 154(f)(4)(J) of the Act.

2.4.3. The Executive Committee reviewed the FCC proposal to Congress for a new Section 333 of the Communications Act, which would make willful and malicious interference subject to the more severe criminal sanctions specified in Section 501. The Committee expressed strong support for more timely and effective remedies to eliminate malicious interference, but noted that there are significant risks associated with proceeding too quickly from administrative to criminal sanctions. The Committee expressed its belief that the objectives of the legislation could be accomplished through full use of the Amateur Auxiliary to gather evidence, and streamlining of the administrative process.

2.5. Next, the Committee considered an ARRL position toward the late-filed "reply comments" of Don Stoner, W6TNS, in RM-5241, Stoner's proposal for a Public Digital Radio Service. Since the late comments did not have the benefit of general public discussion and Stoner did not serve other parties at interest with copies of his "reply comments," on motion of Mr. Wilson the League will file an Opposition to Acceptance of Late-Filed "Reply Comments."

3. Counsel Imlay reported on local RFI and antenna matters. It was the consensus that Counsel Imlay should warn volunteer counsels to be observant for new satellite-antenna ordinances in response to the preemption Order in Common Carrier Docket 85-87, which might impinge on amateur rights enunciated in PRB-1.

4. Review of progress on Board directives:

→ 4.1. The President reported on the current status of PR Docket 85-105, automatic control of amateur stations in data communications (e.g., packet stations). The Commission granted on March 14 the waiver requested by the ARRL allowing the relaying on frequencies above 50 MHz by amateur packet stations using the AX.25 or compatible protocol of third-party messages introduced into the network by stations under direct or remote control, until such time as the Commission completes its consideration of Petitions for Reconsideration in the Docket. On motion of Mr. Wilson, the League will file "Oppositions to Petitions for Reconsideration" filed by others insofar as they ask for automatic control of data stations below 30 MHz and/or appears to ask that automatic data privileges above 50 MHz be suspended until similar privileges can be made available below those frequencies. The League will seek Special Temporary Authorizations for a unified network of approximately 15 packet stations to use automatic control for one year on not more than one frequency per HF band at speeds not to exceed 1200 baud, to determine the potential for interference of such operations to amateur stations using other means of communication.

4.2. Mr. Stevens reported on the progress of the Volunteer Resources Committee toward the tasks assigned it by the Board. Mr. Nathanson presented a similar report on behalf of the Administration and Finance Committee. Mr. Holladay, as chairman, reported on the formation of the Special Committee to Study the Advisory Committee Structure.

4.3. The Executive Vice President presented a report on various assignments to the Headquarters from the Board. The organizational charts called for by a Board motion were distributed. The new ARRL Extra Class certificate, requested by the Board after FCC stopped issuing such certificates, was displayed. A proposal for a variety of bulletin boards in the MCI electronic mail network was perused but not adopted at this meeting. A status report on negotiations for special rates with a hotel chain was presented. Preliminary plans for an amateur radio visitors' center, museum and library to be opened in 1989, were discussed. In accordance with Minute 64 of the 1986 Annual Meeting the price for general circulation copies of the Repeater Coordinator Newsletter was established at \$1.50 per issue; the Newsletter will continue to be furnished on a complimentary basis to established coordinators. Finally, a program to make League study material more readily available to instructors and students was described. The consensus was that the program was needed; it should, however, be monitored on an ongoing basis by the Publications Committee. During the course of the above discussions, the Committee was in recess for luncheon from 1:08 to 1:45 P.M.

4.4. The Executive Vice President presented a report updating the discussions with the FCC on possible assistance from the ARRL to the Commission in issuance of call signs. The discussions continue, with the next response to come from the FCC; no committee action was required at this stage.

5. Studies requested of the Executive Committee by the Board at its 1986 Annual Meeting:

5.1. The Executive Committee deferred until its next meeting consideration of a staff draft of revisions in the policy under which mailing lists are furnished. The Committee has been asked to make recommendations on this subject to the Board at its July meeting.

5.2. The Board asked the Committee to study whether the general policy on ethics and the specific policy on relations with the Federal Government should be applied to additional leadership volunteers. The study was continued until the next meeting.

6. The President reported briefly regarding the IARU Region 2 Triennial Conference to be held in Buenos Aires, Argentina, beginning on October 20. The ARRL delegation headed by President Price will include Executive Vice President Sumner, International Vice President Tod Olson, KØTO, and Director Turnbull. The CRRL delegation will be headed by Vice President/Secretary Harry MacLean, VE3GRO. Also attending from the U.S. and Canada in their IARU roles are Past Vice President Richard L. Baldwin, W1RU, and Past President Carl L. Smith, WØBWJ, President and Vice President, respectively, of the Union; Director Butler as a member of the IARU Region 2 Executive Committee; and CRRL President Thomas B.J. Atkins, VE3CDM, as IARU Region 2 Treasurer. On related matters, the President announced that Director Turnbull had been asked to do preliminary studies on a site in the U.S. which might be proposed as the venue for the next Triennial Conference during the League's 75th Anniversary Year, 1989. The President has asked First Vice President Holladay to represent the ARRL at the 60th Anniversary celebration of the Japan Amateur Radio League in Tokyo November 8, 1986.

7. On motion of Mr. Turnbull, the names of 48 newly elected Life Members were recognized, and the Executive Vice President was directed to list their names in QST.

8. On motion of Mr. Butler, the following clubs were affiliated with the ARRL, all in category 1 except where noted:

Bay Area Amateur Radio Society, Pasadena, MD
Carolina DX Association, Rock Hill, SC
Chesapeake Amateur Radio Service, Chesapeake, VA
Coastal Carolina Community College Communications Club, Jacksonville, NC
(Category III)

Connecticut Valley F.M. Association, Springfield, VT
Corona Norco Amateur Radio Club, Corona, CA
Fannin County Amateur Radio Club, Bonham, TX
Fist & Mouth Contest Company, Downsville, LA
Frontier Amateur Radio Society, Las Vegas, NV
Green County Amateur Radio Association, Albany, WI
Harford Amateur Radio Emergency Mgt. Team, Belair, MD
Junior High School 22 ARC, New York, NY (Category III)
Lodi Amateur Radio Club, Lodi, CA
Mountain Amateur Radio Club, Woodland Park, CO
Natick High School Radio Club, Natick, MA (Category III)

Navajo County Amateur Radio Club, Holbrook, AZ
North Providence ARC, North Providence, RI
Northwest Amateur Radio Society, Spring, TX
Ohio Valley Repeater Club, Inc., Wheelersburg, OH
Packeteers of Long Island, Holbrook, NY
RCA Amateur Radio Club, Camden, NJ
Republic of the Rio Grande ARC, Laredo, TX
Rogers County Wireless Associaton, Claremore, OK
Southern Appalachian Wireless Soc., Inc., Delbarton, WV
Spare Time Amateur Radio Society, Grand Rapids, MI
Twin Cities Repeater Club, Bloomington, MN
Willingboro Area Repeater Club, Willingboro, NJ
Yucaipa Valley ARC, Yucaipa, CA

With this action, the League has the following number of active affiliated clubs: Category I, 1,768; Category II, 12; Category III, 159.

9. Convention matters:

9.1. On motion of Mr. Grauer, the following conventions were approved:

Arkansas State	April 12-13, 1986	North Little Rock, AR
Alabama State	May 17-18, 1986	Birmingham, AL
Oregon State	June 6-8, 1986	Seaside, OR
West Virginia State	July 5-6, 1986	Weston, WV
West Gulf Division	August 1-3, 1986	Oklahoma City, OK
Delta Division	August 9-10, 1986	Shreveport, LA
Colorado State	August 10, 1986	Denver, CO
South Florida Section	October 18-19, 1986	St. Petersburg, FL
Illinois State	November 16, 1986	Rockford, IL

9.2. The committee discussed various National Convention matters; no formal action was required.

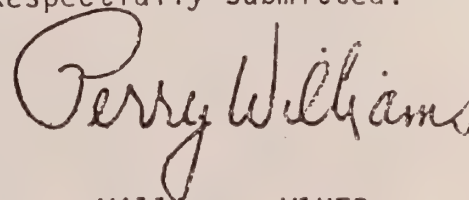
10. On motion of Mr. Wilson, the Treasurer was authorized to open an account at the Andover (Massachusetts) Savings Bank. On further motion of Mr. Wilson, Paul Rinaldo, W4RI, was authorized to sign checks on behalf of the Executive Vice President.

11. The next meeting of the Executive Committee was tentatively scheduled for June 13, in Portland, Oregon.

12. The Executive Committee reviewed and affirmed existing advertising policy.

There being no further business, the Committee adjourned at 5:05 P.M.

Respectfully submitted:



Perry Williams, W1UED
Secretary

BEFORE THE
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of

Waiver of Section 97.80(b) and
97.114(b)(4) of the Amateur
Rules to Permit the Retransmission
of Third-Party Traffic in Certain
Situations

PR Docket No. 85-105

ORDER

Adopted: March 14, 1986

Released: March 14, 1986

By the Chief, Private Radio Bureau:

1. On February 28, 1986, the American Radio Relay League, Inc. (ARRL) filed a Petition for Extraordinary Relief requesting the Commission to temporarily waive Sections 97.80(b) and 97.114(b)(4) of the Rules to permit amateur stations operating in a packet radio network under automatic control to retransmit third-party traffic. The requested waiver would terminate when the Commission adopts a final Order disposing of the petitions for reconsideration filed in PR Docket No. 85-105.¹ In that proceeding, the Commission authorized automatic control for stations transmitting digital communications on amateur frequencies above 50 MHz, but noted that the transmissions of third-party traffic by such stations would require the supervision of the control operator.²

2. The prohibition against unsupervised third-party traffic has served to ensure that amateur facilities and frequencies are not used by non-amateurs. Only a person who has demonstrated the proper qualifications may be a control operator of an amateur station. Such control operators screen any third-party traffic to prevent transmissions which are prohibited by Subpart E of the Amateur Rules.

1 Report and Order in PR Docket No. 85-105, adopted January 13, 1986; FCC 86-18; 51 Fed. Reg. 3069, January 23, 1986.

2 See Sections 97.69(d) and 97.114(b)(4) of the Amateur Rules.

Those prohibitions include, but are not limited to, business communications, secret messages, radiocommunications for unlawful purposes and radiocommunication with nations which have not assented to third-party traffic. Self-policing has long been a cornerstone in the integrity of the amateur service. The presence of the responsible licensed control operator at each station has been a vital element in the amateur self-policing tradition. But ARRL, in the instant petition and in its related petition for reconsideration in this proceeding, argues that this safeguard is neither practical nor effective in the context of packet radio technology.

3. In support of the instant petition the ARRL said that the effect of application of traditional third-party traffic control operator requirements to amateur packet radio would severely limit the development of this network for the rapid and accurate relaying of messages and data. The ARRL requested the waiver only for packet radio digital communications using, or compatible with, their AX.25 protocol.³ The waiver requested by the ARRL only relates to the retransmission of messages already properly screened; a control operator will still be required at every amateur station introducing messages into a packet radio system.

4. In view of the above, we believe a temporary waiver is in order until the Commission has evaluated the arguments presented in the subject petitions for reconsideration and issued a ruling on them. Packet radio in the Amateur Service is in the developmental stages. Although interest in this area is intense and growing, there are still only about 14,000 stations, or about 3% of those licensed, equipped for packet radio operation. Thus the risks of abuse are minimized by the small scope of packet operation which will obtain during the period of this waiver. In the interim, more experience can be gained with automatic control of stations retransmitting with the AX.25 protocol.

5. Accordingly, the waiver request of the ARRL IS GRANTED to the following extent:

- (a) The provisions of Sections 97.80(b) and 97.114(b)(4) are waived to permit amateur stations, retransmitting digital packet radio

3 See AX.25 Amateur Packet Radio Link-Layer Protocol: Version 2.0, Copyright 1984 by the American Radio Relay League; October 1984.

communications (see Section 97.69) on frequencies 50 MHz and above, using the AX.25 (or compatible) protocol, to be operated under automatic control while retransmitting third-party traffic. See Section 97.3(v).

- (b) This waiver applies only to the retransmission of third-party traffic originated at another amateur station which is under local control or remote control. See Section 97.3(m).
- (c) When an amateur station is operated under automatic control, devices must be installed and procedures must be implemented which will ensure compliance with the rules, when the control operator is not present at the control point of the amateur station. See Section 97.80(a).
- (d) This waiver will remain in effect until the Commission takes final action on the petitions for reconsideration filed in PR Docket No. 85-105.

6. Control operators of amateur stations capable of monitoring AX.25 packet transmissions must be alert to the increased dependency upon them for monitoring during the period of this waiver. We call upon them to immediately make known to the responsible control operator of a station retransmitting communications under automatic control any misuse of the station so that the control operator can take prompt corrective action.

Robert S. Foosaner
Chief, Private Radio Bureau

BEFORE THE
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of

Waiver of Section 97.80(b) and
97.114(b)(4) of the Amateur
Rules to Permit the Retransmission
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2. The prohibition against unsupervised third-party traffic has served to ensure that amateur facilities and frequencies are not used by non-amateurs. Only a person who has demonstrated the proper qualifications may be a control operator of an amateur station. Such control operators screen any third-party traffic to prevent transmissions which are prohibited by Subpart E of the Amateur Rules.

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2 See Sections 97.69(d) and 97.114(b)(4) of the Amateur Rules.

Those prohibitions include, but are not limited to, business communications, secret messages, radiocommunications for unlawful purposes and radiocommunication with nations which have not assented to third-party traffic. Self-policing has long been a cornerstone in the integrity of the amateur service. The presence of the responsible licensed control operator at each station has been a vital element in the amateur self-policing tradition. But ARRL, in the instant petition and in its related petition for reconsideration in this proceeding, argues that this safeguard is neither practical nor effective in the context of packet radio technology.

3. In support of the instant petition the ARRL said that the effect of application of traditional third-party traffic control operator requirements to amateur packet radio would severely limit the development of this network for the rapid and accurate relaying of messages and data. The ARRL requested the waiver only for packet radio digital communications using, or compatible with, their AX.25 protocol.³ The waiver requested by the ARRL only relates to the retransmission of messages already properly screened; a control operator will still be required at every amateur station introducing messages into a packet radio system.

4. In view of the above, we believe a temporary waiver is in order until the Commission has evaluated the arguments presented in the subject petitions for reconsideration and issued a ruling on them. Packet radio in the Amateur Service is in the developmental stages. Although interest in this area is intense and growing, there are still only about 14,000 stations, or about 3% of those licensed, equipped for packet radio operation. Thus the risks of abuse are minimized by the small scope of packet operation which will obtain during the period of this waiver. In the interim, more experience can be gained with automatic control of stations retransmitting with the AX.25 protocol.

5. Accordingly, the waiver request of the ARRL IS GRANTED to the following extent:

- (a) The provisions of Sections 97.80(b) and 97.114(b)(4) are waived to permit amateur stations, retransmitting digital packet radio

3 See AX.25 Amateur Packet Radio Link-Layer Protocol: Version 2.0, Copyright 1984 by the American Radio Relay League; October 1984.

communications (see Section 97.69) on frequencies 50 MHz and above, using the AX.25 (or compatible) protocol, to be operated under automatic control while retransmitting third-party traffic. See Section 97.3(v).

- (b) This waiver applies only to the retransmission of third-party traffic originated at another amateur station which is under local control or remote control. See Section 97.3(m).
- (c) When an amateur station is operated under automatic control, devices must be installed and procedures must be implemented which will ensure compliance with the rules, when the control operator is not present at the control point of the amateur station. See Section 97.80(a).
- (d) This waiver will remain in effect until the Commission takes final action on the petitions for reconsideration filed in PR Docket No. 85-105.

6. Control operators of amateur stations capable of monitoring AX.25 packet transmissions must be alert to the increased dependency upon them for monitoring during the period of this waiver. We call upon them to immediately make known to the responsible control operator of a station retransmitting communications under automatic control any misuse of the station so that the control operator can take prompt corrective action.

Robert S. Foosaner
Chief, Private Radio Bureau

Posted: Fri Feb 21, 1986 6:54 PM PST
From: TOKAMOTO
To: DOCS
Subj: JAS1.DOC

Msg: KGIG-2396-4697

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Introduction:

JAS-1 is an amateur radio satellite, promoted by JARL as a joint venture with NASDA. NEC constructed "system" units (space frame, power supply etc.), while JAMSAT, with its selected volunteer JAS-1 project team, designed and built the "mission" units (transponders, telemetry/command and house keeping micro-computer) and ground support systems.

JAS-1 has been completed and has passed all the necessary tests. It is in a clean room waiting for the launch, currently scheduled for August 1986.

The outline of this unique satellite is explained in the following.

Many thanks to Harold Price, NK6K, for his assistance in the preparation of this article.

February 11, 1986

N6MBM/JA2PKI
Tak Okamoto
191 Pinestone,
Irvine, CA 92714

Hamnet : 72307,3224
Telemail : TOKAMOTO

JAS-1 Mission Objectives:

1. JAS-1 will provide reliable world-wide amateur radio communications.
2. JAS-1 will enable radio amateurs to study tracking and command techniques.
3. JAS-1 will offer an in-space "proving ground" for radio amateur developed and built transponders and sub-systems.
4. JAS-1 will provide NASDA an opportunity to carry out a "multi-payload" launch using their new "H-1" launcher. (NASDA has never engaged in a multi-payload launch, thus the JAS-1 project will offer NASDA an excellent opportunity by providing them with an active payload having its own telemetry-beacon and transponder for

remains.)

1. Form and General dimensions:

The spacecraft takes the form of a 26-facet polyhedron, which measures 400 mm X 400 mm X 470 mm and weighs 50 kilograms.

2. Launch and Orbit:

JAS-1 will be launched into a circular low-earth orbit, which will be non-sun synchronous and non-polar.

Launch vehicle : H-1 2 stage rocket

Launch number : Test Flight # 1

Launch site : Tanegashima Is. Japan

Launch date : August 1986

Estimated inclination : 50 degrees

Estimated altitude : 1500 k.m.

Estimated period : 120 minutes

Estimated window per pass : 20 minutes/pass

Estimated passes per day : 8 passes/day

3. Designed life:

Estimated lifetime is 3 years

4. Special Features of JAS-1:

JAS-1 carries two separate mode J transponders. One is a linear transponder, and the other is a digital "store-and-forward" transponder mainly for non-real-time communication between stations located in different time zones.

The reasons for selecting mode J for this first Japanese amateur radio communications satellite are:

a) It is becoming increasingly difficult to use 145-MHz for a satellite downlink because of man-made electrical noise and other interference.

b) The planners of JAS-1 wanted to provide a successor to AMSAT OSCAR-8's mode J, which was originally developed by JAMSAT's engineering team back in 1976.

c) 435 MHz is much quieter than 145 MHz as a downlink band, it is comparatively free from man-made

noise and sky-temperature effects.

The digital transponder will provide "error-free" information exchange.

5. Transponders:

a) The linear transponder = mode JA :

The passband will be 100 kHz wide. The transponder will have an output of 1 watt p.e.p. Ground stations will need an uplink power of 100 watts e.i.r.p. The sidebands will be reversed, i.e., the uplink is LSB, the downlink is USB. There will be a 100 mW c.w. beacon switchable to PSK when needed.

Uplink pass band : 145.90 MHz - 146.00 MHz
Downlink pass band : 435.80 MHz - 435.90 MHz
Beacon freq. : 435.795 MHz
Translate freq. : 581.80 MHz

b) The digital transponder = mode JD :

There will be four 145 MHz band input channels using Manchester coded FM for the uplink. Ground stations will need 100 watts e.i.r.p. There will be one downlink channel in the 435 MHz band using PSK, the output will be 1 watt RMS.

Channels are :

Uplink channel 1 : 145.850 MHz
" channel 2 : 145.870 MHz
" channel 3 : 145.890 MHz
" channel 4 : 145.910 MHz
Downlink channel : 435.910 MHz

The data format is HDLC. The protocol is AX.25 Level 2 Version 2. The data transfer rate is 1200 bps for both uplink and downlink.

The reasons for not using Bell-202 type FSK modulation are:

a) To reduce the parts count onboard JAS-1. Using Manchester coded FM for uplink reduces JAS-1's onboard decoder chip count by 16.

b) To improve the downlink margins. Due to JAS-1's tight power budget, only 1 watt is generated by the downlink transmitter. A more efficient modulation scheme like PSK is required.

JAS-1 will be a store and forward system but not a real time dissester. Dissesting is not an effective use of a low orbit satellite such as JAS-1, which has a limited communication foot print and visibility time.

JAS-1 has 4 uplink channels for 1 downlink channel. This is because the difference of channel efficiency

between uplink and downlink. An uplink channel is shared by several ground users. Since the ground users can't hear each other, and are listening to the downlink channel anyway, the uplinks are subject to packet collisions. This scheme is called "Pure ALOHA", and is known to have a theoretical maximum channel throughput of 18.4%. The JAS-1 downlink is 100% efficient, since only JAS-1 transmits there. To balance capacity, as well as add redundancy, four uplink channels are used.

The combined uplink efficiency is then $4 * 18.4\%$ or 76%. The remaining downlink time is used for general messages and telemetry data.

JAS-1 will accept a connect from only one station at a time with the software scheduled for initial use. Multiple connections will be supported in subsequent software updates. General packet operation is scheduled to begin in November 1986.

6. Digital Hardware:

The microprocessor is a MIL-STD-883B screened NSC-800 running with a 1.6MHz clock. This is the only processor on board. It controls the digital transponder and also acts as an IHU (Integrated Housekeeping Unit).

The on-board memory has a 1.5MB physical storage capacity. 48 chips of NMOS 256K DRAMs are used. A hardware based error-detection/correction circuit is incorporated to protect the entire 1.5 MB and provide an 1 MB error free memory area. The system program occupies some 32KB, the rest is used for ~~general~~ storage.

The memory unit is physically divided into four identical 256KB memory cards, any one of which can be assigned as the system area. Up to three cards can be turned off. This design provides system redundancy and allows command stations to control power consumption without a total loss of service.

JAS-1 has five hardware HDLC controllers. Four of them are for the uplink channels and one is for the downlink channel. In total, these controllers consist of some 140 CMOS MSIs, yet their power consumption is less than that of a single NMOS LSI HDLC controller like WD-1931.

JAS-1 does not have any ROM but has simple hardware boot strap circuit instead. This design is to increase system flexibility and reliability.

7. Power system:

25 of JAS-1's 26 faces are covered with a total of 979 pieces of solar cells. They will generate 8.5 watts of power at the beginning of life.

JAS-1 employs 11 Ni-Cd battery cells with a capacity of

6 AH. These supply 14 volts average to JAS-1's main power buss. The 14 volts is converted and regulated to +10V, +5V and -5V.

8. Antenna system:

JAS-1 has three antennas.

2 m reception antenna

Slant 1/4 wave Mono-pole Isotropic -4 dBi gain

70 cm transmission antenna

Mode-JA : Slant Turnstile L.H.C.P. +Z axis +3 dBi gain

Mode-JD : Slant Turnstile R.H.C.P. -Z axis +3 dBi gain

9. Attitude control:

Forced shaking using the earth's geomagnetic field. JAS-1 has two 1 ATm sq. permanent magnets in its Z axis.

10. Telemetry:

Analog system telemetry has 12 analog channels and 33 system status flags. This telemetry can be sent without the help of the NSC800 microprocessor and will be turned on automatically by the separation from the H-1 launcher. The telemetry is sent on the 100mW beacon on 435.795MHz in CW, switchable to PSK.

Digital system telemetry has 29 analog channels and 33 system status flags. This software driven telemetry can be sent in any format, and can include short text messages. This telemetry can be sent on either the mode JD downlink channel (435.910MHz) or the mode JA CW beacon (435.795MHz).

11. Command:

A simple 3-channel tele-command system is used for global control functions, e.g. JA transponder "ON"/"OFF", JD transponder "ON"/"OFF" and independent "ON"/"OFF" of the A-0 beacon. An additional 37 channels are available mainly for controlling the digital transponder.

Onboard command from the NSC-800 is also available.

12. Ground stations:

Mode-JA:

A ground station setup which was used for Amsat Oscar-8 mode-J can be used for JAS-1 mode-JA. A station with a 10 watt 2 m SSB transmitter and a 10dBi beam for uplink;

:UDD:HANK:MAIL:JAS1.DOC

3-MAR-86 23:06:26 PAGE 6

and a 70 cm receiver (with low NF) with a 15dB beam for downlink; should be adequate for this job;

Mode-JD:

In addition to the mode-JA set up, FM mode is required for the 2 m transmitter.

Since JAS-1 uses the standard AX.25 protocol and 1200 bps data rate, ground stations will be able to use a TAPR-style TNC, a 2 m FM transmitter and a 70 cm receiver without modification.

The JAS-1 modem, a special interface board, will be made available containing the Manchester modulator and an audio PSK demodulator allowing connection to the "modem disconnect" connector of a TAPR-style TNC. The modem also connects to the audio input and PTT of the 2m FM transmitter and to the audio output and frequency control (option) of a 70 cm SSB receiver.

Although JAS-1 will be available to individual access, the general amateur community will benefit from "JAS-1 gateways". Messages relayed through gateways can be sent worldwide and is as easy as sending messages to distant stations via a WORLI HF gateway.

13. Outline of project history/schedule:

November 1982 : Freezing of conceptual/preliminary design

December 1982 : Preliminary Design

April 1983 : Detail Design

- June 1984 Engineering Modules Integration & Test
Ground Support System Integration

July 1984 : Flight Model #1 Integration & EIC/MIC

- December 1984

January 1985 : Flight Model #1 General Test

- March 1985

January 1985 : Flight Model #2 Integration & EIC/MIC

- August 1985

August 1985 : Flight Model #2 General Test

- November 1985

November 1985 : Software development

- ?

References:

JARL News, JAS-1 User's Guide (Those are available only in Japanese.)

Hi, I need to make up the newsletter this weekend. I'm planning to include the "leftover" DRNET stuff that you had given Walt.,, maybe we can keep it down to one unit of postage. Do you have any words of wisdom for the newsletter?

Jim Tittsler, AIAA (W) (408) 745-4988
 135 Riviera Dr #342 (H) (408) 395-5442
 Los Gatos, CA 95030 145.07 ***hr nse system

usenet: ...lll-crg!vecevr!later!lwt

April 3, 1986

IARU REGION SECRETARIES
PACKET-RADIO REFERENTS FOR MEMBER-SOCIETIES

Gentlemen:

It is time to share with you our story on asking the Federal Communications Commission to allow automatic control of digital communications above 50 MHz. A chronology follows:

At its November 1983 meeting, the ARRL Ad Hoc Committee on Amateur Radio Digital Communication agreed to recommend that the Board of Directors consider petitioning the FCC to permit automatic operation for digital communications. That recommendation was made to, and accepted by the Board at its March 1984 meeting (Minute 60). The Board directed the Committee to work with staff and counsel to draft a petition to the FCC for consideration at the October 1984 Board meeting. At its October meeting, Board Minute 70 approved filing a petition for automatic control of digital communication above 30 MHz.

In November 1984, counsel filed the petition (Enclosure A), which was given the designation RM-4879.

Then in April 1985, the FCC issued a Notice of Proposed Rule Making (Enclosure B) and introduced the provision that "No amateur radio station may be operated under automatic control while transmitting third-party traffic." The proceeding was designated PR Docket No. 85-105.

ARRL comments filed in June 1985 (Enclosure C) took issue with excepting automatic control while transmitting third-party traffic.

In January 1986, the FCC issued its Report and Order in this matter (Enclosure D), which in effect denied our request concerning third-party traffic while otherwise granted permission for automatic control above 50 MHz.

At its January 23-24, 1986 meeting, the Board adopted Minute 53 which directed "that the President take such actions as may be necessary and appropriate to cause the FCC Docket 85-105 to be amended to correct its restrictive effect on the development of packet radio. . ."

In February, the ARRL filed a Petition for Partial Reconsideration (Enclosure E), which explained why packet radio should be permitted to use automatic control for third-party traffic.

Several days later, President Price, Executive Vice President Sumner and Secretary Williams visited the FCC to explain the need for automatic control for third-party traffic. Based on conversations at the FCC, the ARRL immediately filed a Petition for Extraordinary Relief (Enclosure F) to ask for relief specifically for packet radio.

On March 14, 1986, the FCC issued an Order which temporarily waives the need for having a control operator present when retransmitting third-party traffic on packet radio above 50 MHz.

This is not the end of the story as the FCC now has to sort out 20 Petitions for Reconsideration, which is expected to take them until sometime this coming summer. Although we have not won this privilege permanently, one could conclude that a precedent may have been set.

Note that we now have privileges for automatic control of digital communications only above 50 MHz. While there are advocates for petitioning the FCC to allow automatic control below 50 MHz, the Board has not taken a position favoring it. It is clear that such a step would affect other users of the HF amateur bands, both domestic and international, and would require extensive study and consultation.

73,



Paul L. Rinaldo, W4RI
Chairman, Ad Hoc Committee on
Amateur Radio Digital Communications

PR/cl

cc: IARU Administrative Council
President Price
International Affairs Vice President Olson
Ad Hoc Committee on Amateur Radio Communication

Before the
Federal Communications Commission
Washington, D. C. 20554

FCC 86-192
36631

In the Matter of

) PR Docket No. 86-161

)

Amendment of the Amateur Radio
Service Rules to Expand the
Privileges Available to Novice
Operators.

) RM-5022 RM-5038
) RM-5023 RM-5251
) RM-5024 RM-5281
) RM-5025 RM-5282

NOTICE OF PROPOSED RULE MAKING

Adopted: April 18, 1986

; Released: April 30, 1986

By the Commission:

1. Notice of Proposed Rule Making in the above-captioned matter is hereby given.

2. Larry W. Garens, Brady, Texas, has filed five petitions for amendment of the Amateur rules. Their object is the expansion of operating privileges for Novice operators. Petition RM-5022 proposes to allow Novice and Technician¹ operators the use of telegraphy and radioteleprinter privileges in the 10-meter band; RM-5023 proposes to allow telephony privileges in the 10-meter band; RM-5024 requests radiotelegraphy on 30 meters; and RM-5025 proposes telegraphy and telephony in the 1.25-meter band. These petitions were filed on February 27, 1985. Mr. Garens filed another petition on November 29, 1985 (RM-5251) requesting Novice privileges in a small segment of the 902-928 MHz band. In this frequency band, he proposes telegraphy, telephony, radioteleprinter, packet radio and ASCII digital communications. Both in RM-5022 and RM-5251, Mr. Garens says he is looking for persons with computers to enter the Amateur Radio Service and use their radios and computers together.

3. On June 6, 1985, the American Radio Relay League, Inc. (ARRL) filed a petition for rule making (RM-5038) to enhance the operating privileges of Novice operators. The ARRL seeks to provide greater motivation for amateurs-to-be to obtain their first license, without reducing the incentive to upgrade by attaching too many privileges to

¹ Since the Technician class license includes all the privileges of the Novice class, any enhancement of Novice class privileges would also benefit the Technician class.

what is, and should continue to be, an elementary license. It proposes to allow Novices telephony and data privileges sufficient to permit communication with other local amateurs and to provide an occasional opportunity for long-distance communications. The essential elements of the ARRL's proposal are:

- (a) Authorize Novice control operators digital communication privileges in the 10 meter band on frequencies 28.1-28.3 MHz;
- (b) Authorize Novice control operators emission J3E telephony privileges in the 10 meter band on frequencies 28.3-28.5 MHz;
- (c) Authorize Novice control operators frequency privileges in the entire 1.25 meter band with all emission privileges authorized for that band and with a transmitter power limit of 25 watts. Stations in repeater operation could retransmit the signals from Novice stations, but no Novice licensee could be the control operator or the station licensee of a station in repeater operation;
- (d) Authorize Novice control operators frequency privileges in the 0.23 meter band on frequencies 1246-1260 MHz with a transmitter power of 5 watts similar to the conditions proposed for the 1.25 meter band.

4. The ARRL requests that Section 97.67 (d) be amended to allow Novice operators 200 watts PEP power on the proposed expanded 10-meter Novice subband; 25 watts at 220-225 MHz; and 5 watts at 1246-1260 MHz. It also requests that other operators who are now authorized to operate at higher power levels in these three subbands be permitted to continue to operate there with those higher powers.²

2 The ARRL would retain the present 200 watts PEP power limit for all licensees in the three existing Novice subbands below 28 MHz. At present, the 200 watt power limitation for all licensees also applies in the subband 28100-28200 kHz. Under this proposal, that limitation would be removed for other than Novice and Technician operators. We are especially interested in hearing from Novice licensees on this issue.

5. The ARRL also requests that the Element 2 examination syllabus be expanded to include topics about digital communications and telephony techniques. According to the ARRL:

This is necessary in order that the examination content be commensurate with the privileges granted by the license class. In this connection, it would be proper to expand the Novice written examination to thirty questions and the question pool (PR Bulletin 1035A) to 300, to accommodate additional questions on operational aspects of the additional privileges available to Novice licensees.

In replying to comments to its petition, the ARRL elaborated:

It is not the League's intention by this suggestion that the examination be made more difficult, as that would discourage newcomers to amateur radio—the antithesis of the League's proposal. Rather, the goal is to increase the comprehensiveness of the examination without increasing the difficulty thereof. Merely expanding the Novice class examination question pool to 300 to accommodate questions on the operational aspects of the additional privileges should create no deterrent to prospective entrants to the Novice ranks. It will, however, insure that at least the use of the new privileges are understood by the newcomer, and that his or her on-the-air operating practices are well disciplined and orderly from the outset.

6. The ARRL also seeks to preserve the integrity of the Novice examination. To this end, the ARRL requests that Section 97.28 be amended to require that each examination for the Novice class operator license be administered by two volunteer examiners holding General class licenses or above, rather than the presently required one examiner.

7. Richard E. Darwickl also seeks enhancement of the Novice operator privileges in RM-5282. He proposes to add new privileges in the 160-meter band, and expand privileges in the 40-meter and 80-meter bands for Novice and Technician operators. Mr. Darwickl says that his proposal is designed to increase the possibility of obtaining training in emergency traffic handling and promoting higher technical skills, including telegraphy proficiency.

8. Albert D'Errico, Jr., and others, many of whom are affiliated with the Six Meter International Radio Klub (SMIRK), propose additional Novice privileges for the 6-meter band (RM-5281). They propose to add telegraphy, upper sideband and amplitude modulation emissions to the 6-meter band for Novice operation, with a maximum authorized power of 15 watts. SMIRK suggests a frequency subband of 200 kHz between 50.3 and 50.5 MHz.

9. The comments received were, in the main, directed to the proposals contained in RM-5038. The greatest concern was with the proposal to allow Novices single sideband telephony emission on 10-meters. Commenters believe that this would pave the way for the 10-meter band to become undisciplined radio operation. They also fear that Novices will buy ready-made equipment and not get into the technical aspects of amateur radio. Some commenters suggest instead that double sideband amplitude modulation be permitted. This would give Novices the opportunity to use either home-constructed equipment or minimally-modified CB equipment, both options being cost-effective, and technically relatively simple.

10. Another concern is that once the Novice operator is authorized telephony privileges, the incentive to upgrade would diminish or become non-existent. Also argued is that Novices are "entry level" operators and, therefore, inexperienced. One commenter stated that such operators would cause second harmonic interference to TV channel 2 and to other radio services, if they are given privileges at 28.3-28.5 MHz.

11. The comments also suggest that, if enhanced privileges are granted Novices, the Novice license should be made non-renewable (or be changed from 10 years to 5 years and then made non-renewable) in order to force Novices to upgrade. Making the Novice license a part of the volunteer examination system (with or without a fee) to preclude cheating was also suggested. A commenter also opposed the ARRL's proposal to "grandfather" existing Novice licensees for the enhanced privileges, without reexamination.

12. One commenter said that it would be a mistake to take "entry level" licensees and give them the privilege of digital communications, especially on an international frequency band such as the 10-meter band. That commenter noted, as did others, that Novice privileges between 28.3-28.5 MHz would interfere with international beacons. The proposal to allow Novice privileges at 1246-1260 MHz was also questioned. One commenter objected on the basis that operation in that band requires technical skill at the suggested lower power of 5 watts, and that "entry level" operators should not be exposed to the radiation there. Opening the 220 MHz band to Novices was opposed

on the ground that repeater operation in that band needs to be protected from amateurs who are not allowed to be control operators or licensees of stations in repeater operation.

13. Support for the various proposals reflects a concern that something must be done to attract a new generation to amateur radio. Mr. David C. Andrus captures this idea rather succinctly:

I feel that the single most important thing that the ARRL's proposal for enhancement of the Novice license will do is to encourage many young people who are presently involved in computers at home and school to consider the expansion of their "reach" with radio-linked telecommunications.

The same theme is sounded by other commenters, but with the caveat that bringing new people into amateur radio should be done carefully and not with a "quick-fix" approach.

14. Our statistics show a decline in both the number of new Novice operators and of total Novice operators. There are 10,000 fewer Novices now than there were two years ago.³ The ARRL blames the decline on limited operating privileges of Novices. Of the four amateur bands now authorized for operation, the ARRL states that propagation conditions are so poor in the current phase of the sunspot cycle that, except for local communications, operation is largely limited to the 80-meter and 40-meter bands. According to the ARRL, even in these two bands, Novices are frustrated and inhibited because of Canadian amateur telephony operations in the 80-meter band and international broadcast activity in the 40-meter band. The ARRL reasons that persons at the beginner level must be allowed enhanced opportunities if they are to pursue greater operating privileges in amateur radio.

3 The following table shows the attrition rate for Novices.

	<u>FY 83</u>	<u>FY 84</u>	<u>FY 85</u>
New Novices	18,744	17,392	15,913
Upgraded	10,274	8,829	10,422
Dropped out	9,129	14,883	9,615
Novices at year end	86,781	80,461	76,337

15. One of the fundamental purposes of amateur radio is to maintain a pool of operators, technicians and electronics experts. In light of the apparent downward trends in Novice operators, we are concerned that a valuable national resource is being diminished. Accordingly, we will propose rule making, largely along the lines proposed by ARRL, in the hope that an enhanced Novice license will benefit the service and reverse the trends.⁴ It must be recognized that there are currently two petitions for rule making pending before the Commission, RM-4829 and RM-4831, seeking accommodation for narrowband land mobile operations in the 216-225 MHz band. Additionally, in General Docket 80-739 the Commission decided to maintain the fixed, mobile and amateur services as co-primary allocations until the FCC/National Telecommunications and Information Administration working group develops an appropriate allocation plan for this band.⁵ In view of this, we will not finalize the matter of permitting novice amateurs in the 220-225 MHz band until these petitions are resolved.

16. We invite particular discussion of the ARRL's request for two examiners to administer Novice examinations should the privileges of this license be enhanced. Integrity of the license is important, but we are not convinced that two examiners is the right safeguard to employ. Including Novices in the Volunteer Examination System has merit, but we are reluctant to disturb the present procedure under which aspirants to amateur radio receive their licenses quickly and free of charge. Moreover, we are unsure of the capacity of the Volunteer Examination System to handle this volume of applicants. Commenters should also have due regard for the need to minimize changes to FCC forms.

⁴ We inquire whether the trends discussed above may not be a result of the limited privileges of the Novice class license, but may instead reflect an imbalance in the privileges and qualifications associated with the present license classes. If so, we ask for comment whether the following adjustment would be helpful. The Technician operator written test requirements could be confined to those topics from Element 3 commensurate with the VHF and UHF privileges authorized by the license. It would be a simple matter to rearrange the topics into two syllabi: Element 3(A) for VHF and UHF; Element 3(B) for MF and HF. Element 3(A) would be a written test requirement for a Technician-and-above license. Element 3(B) would be a written test requirement for a General-and-above license.

⁵ See paragraphs 30 and 31, Second Report and Order in General Docket 80-739, adopted November 8, 1983, Implementation of the 1979 WARC, FCC 83-511; 49 FR 2357, January 19, 1984.

17. For purposes of this non-restricted notice and comment rule making proceeding, members of the public are advised that ex parte contacts are permitted from the time the Commission adopts a Notice of Proposed Rule Making until the time a public notice is issued stating that a substantive disposition of the matter is to be considered at a forthcoming meeting. In general, an ex parte presentation is any written or oral communication (other than formal written comments/pleadings and formal oral arguments) between a person outside the Commission and a Commissioner or a member of the Commission's staff which addresses the merits of the proceeding. Any person who submits a written ex parte presentation must serve a copy of that presentation on the Commission's Secretary for inclusion in the public file. Any person who makes an oral ex parte presentation, addressing matters not fully covered in any previously-filed comments in the proceeding, must prepare a written summary of that presentation; on the day of the oral presentation, that written summary must be served on the Commission's Secretary for inclusion in the public file, with a copy to the Commission official receiving the oral presentation. Each ex parte presentation must also state by docket number the proceeding to which it relates. See generally, Section 1.1231 of the Commission's Rules, 47 CFR 1.1231. A summary of the Commission's procedures governing ex parte contacts in informal rule makings is available from the Commission's Consumer Assistance Office, FCC, Washington, D.C. 20554, (202) 632-7000.

18. Authority for issuance of this Notice is contained in Sections 4(1) and 303(c) and (r) of the Communications Act of 1934, as amended, 47 U.S.C. 154(1) and 303(c) and (r). Pursuant to applicable procedures set forth in Section 1.415, 47 CFR 1.415, of the Commission's Rules, interested persons may file comments on or before July 16, 1986, and reply comments on or before August 20, 1986. All relevant and timely comments will be considered by the Commission before final action is taken in this proceeding. In reaching its decision, the Commission may take into consideration information and ideas not contained in the comments, provided that such information or a writing indicating the nature and source of such information is placed in the public file, and provided further that the fact of the Commission's reliance on such information is noted in the Report and Order.

19. In accordance with Section 1.419 of the Commission's Rules, 47 CFR 1.419, formal participants must file an original and five copies of their comments and other materials. Participants who wish each Commissioner to have a personal copy of their comments should file an original and eleven copies. Members of the general public who wish to express their interest by participating informally may do so by submitting one copy. All comments are given the same consideration, regardless of the number of copies submitted. Each set of comments

must state on its face the proceeding to which it relates (PR Docket Number) and should be submitted to: The Secretary, Federal Communications Commission, Washington, D.C. 20554. All documents will be available for public inspection during regular business hours in the Commission's Public Reference Room at its headquarters in Washington, D.C.

20. Pursuant to 5 U.S.C. 603, we submit this initial regulatory flexibility analysis. We propose to enhance the Amateur Novice class operator license by allowing Novice licensees greater operating privileges. These privileges are proposed for portions of the 28, 220 and 1200 MHz bands and will include telephony which is not presently permitted for Novices. Appropriate power levels are also proposed. Our authority to promulgate such rules derives from Sections 4 (l) and 303 (c) and (r) of the Communications Act of 1934, as amended. The new rules are expected to increase interest among all persons in becoming amateur radio operators. We estimate that at least 20,000 persons each year will become Novices. It is possible that some of these new applicants will purchase single sideband telephony radio equipment. Thus, there is expected to be some effect on the sale of amateur radio equipment, including antennas, towers, transmission lines, transceivers, microphones, connectors and filters. No additional record keeping requirements are being imposed. We cannot currently determine with any specificity the increase in equipment sales, if any, that small entities may experience. We will examine this proceeding's effect on small entities further in the Final Regulatory Flexibility Analysis in this proceeding.

21. Insofar as they are consistent with the proposed rules adopted herein, rule making petitions RM-5022, 5023, 5024, 5025, 5038, 5251, 5281 and 5282 ARE GRANTED, and in all other respects ARE DENIED.

22. IT IS ORDERED, That the Secretary shall cause a copy of this Notice to be served upon the Chief Counsel for Advocacy of the Small Business Administration and the Secretary shall also cause a summary of this Notice to be published in the Federal Register.

23. For information concerning this proceeding, contact
Maurice J. DePont, Federal Communications Commission, Private Radio
Bureau, Washington, D.C. 20554, (202) 632-4964.

FEDERAL COMMUNICATIONS COMMISSION

William J. Tricarico
Secretary

Attachment: Appendix

APPENDIX

Part 97 of Chapter 1 of Title 47 of the Code of Federal Regulations would be amended as follows:

1. The authority citation for part 97 would continue to read as follows:

Authority citation: 48 Stat. 1066, 1082, as amended;
 47 U.S.C. 154, 303. Interpret or apply
 48 Stat. 1064-1068, 1081-1105, as amended;
 47 U.S.C. 151-155, 301-609, unless otherwise
 noted.

2. Section 97.7 (a) would be revised, as follows. The line entry for the 10-meter band would be revised to read as shown below. Following the kilohertz listing, a megahertz listing for the 1.25 and 0.25-meter bands would be added.

§ 97.7 Frequency privileges.

* * * * *

(a) Novice class:

Meter band	Terrestrial location of the amateur radio station			Limitations
	ITU Region 1	ITU Region 2	ITU Region 3	(see para.(c))

kilohertz

10	28100-28500	28100-28500	28100-28500	1
----	-------------	-------------	-------------	---

megahertz

1.25	-----	220-225	-----	1, 3, 4, 5, 32
0.25	1246-1260	1246-1260	1246-1260	1, 5, 11, 32

* * * * *

3. In Section 97.7 (b), the line entry for the 10-meter band would be revised to read:

§ 97.7 Frequency privileges.

* * * * *

(b) * * *

Meter band	Terrestrial location of the amateur radio station			Limitations (see para.(g))
	ITU Region 1	ITU Region 2	ITU Region 3	
10	28100-28500	28100-28500	28100-28500	1

* * * * *

10 28100-28500 28100-28500 28100-28500 1

* * * * *

4. Section 97.7 (g) (1) would be revised to read, as follows:

97.7 Frequency privileges.

* * * * *

(g) Limitations:

(1) Novice and Technician class control operators are limited to the use of International Morse code when the station is transmitting emission A1A on frequencies 3700-3750 kHz, 7100-7150 kHz (7050-7075 kHz when the terrestrial station location is within Region 1 or 3), 21100-21200 kHz and 28100-28500 kHz.

* * * * *

5. Section 97.61 (a) would be revised by adding a new line entry before 28000-28300, by removing limitation 1 from the line entry for 28000-28300 kHz and by adding a new limitation 3 in the line entry for 28300-29700 kHz, as follows:

§ 97.61 Authorized emissions.

(a) kilohertz:

Frequency Band (kHz)	Emissions	Limitations (see para.(d))
28000-29700	A1A	
28000-28300	A1A, F1B	
28300-29700	A1A, A3E, F3E, E3E, A3C, F3C, A3F, F3F, H3E, J3E, R3E	3

6. Section 97.61 (d) would be revised to add a new limitation (3), as follows:

§ 97.61 Authorized emissions.

(d) * * *

(1) * * *

(2) * * *

(3) Novice and Technician class control operators may not use emissions A3E, F3E, E3E, A3C, F3C, A3F, F3F, H3E or R3E when operating in the frequency band 28300-28500 kHz.

7. Section 97.67 is revised by removing subparagraph (6) of paragraph (d), and by adding new paragraphs (j) and (k), as follows:

§ 97.67 Maximum transmitting power.

(j) The transmitter power of each amateur station at which the control operator holds only Novice or Technician class operator privileges shall not exceed 200 watts peak envelope power when transmitting in the 10-meter band.

(k) The transmitter power of each amateur station at which the control operator holds only Novice class operator privileges shall not exceed 25 watts peak envelope power when transmitting in the 1.25-meter MHz band, and 5 watts peak envelope power when transmitting in the 0.23-meter band.

8. Section 97.85 would be revised by adding a new paragraph (i).

§ 97.85 Repeater operation.

* * * * *

(i) No amateur station at which the control operator or station licensee holds only Novice class privileges shall be in repeater operation.

9. Section 97.86 would be revised by adding a new paragraph (e).

§ 97.86 Auxiliary operation.

* * * * *

(e) No amateur station at which the control operator or station licensee holds only Novice class privileges shall be in auxiliary operation.

10. Section 97.87 would be revised by adding a new paragraph (f).

§ 97.87 Beacon operation.

* * * * *

(f) No amateur station at which the control operator or station licensee holds only Novice class privileges shall be in beacon operation.



THE AMERICAN RADIO RELAY LEAGUE, INC.

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DAVID SUMNER

203.656.1541

QST

April 3, 1986

K.O. Learner, II K9PVW
PO Box 5014
Kokomo, IN 46902

Dear K.O.:

Thank you for your suggested standard for identification of digital data via packet radio. I'll circulation it to the ARRL Ad Hoc Committee on Amateur Radio Digital Communication for their consideration.

73,

Paul L. Rinaldo, W4RI
Chairman, Ad Hoc Committee on
Amateur Radio Digital Communication

PLR/cs

OR

A Standard for Identification of Digital Data via Packet Radio

Preliminary 26 Mar 86

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Packet Radio has grown very quickly in recent months and a nationwide network will soon be a reality. All forms of communications will benefit from transmission via digital techniques. For example, digital encoding of voice information or SSTV for transmission via packet is on the horizon.

Because digital data is 'hidden' from humans, a computer readable identification must be included with the non-ASCII data to allow 'reading the mail'. An identification standard that will be universally applied is required.

The ID standard must allow for experimentation, as this is its primary reason for existence. Perhaps the detailed scheme could be similar to the FCC 'emissions type' definition.

Use of an agreed upon standard 'type' description allows a computer to receive the packets and determine the rules to 'display' the message to the user. This might mean the exact algorithm for reproducing a voice or SSTV message. The human could read the type of data by looking up the three 'type' data fields from a table if desired. It is very important to provide enough room in the definition scheme to allow descriptions to grow for many years.

A proposed Standard for ID of Digital Data via packet radio:

Three descriptors:

- | | |
|-------------|---|
| 1. Category | ie. voice, fax, sstv, icons, wx images, software |
| 2. Type | ie. LPC, Std, Robot 36s color, Mac, GOES, Z80 asm |
| 3. Level | ie. 1, 2, 7, 4, 4,3 |

Each descriptor is a one byte (binary) value

Category and Type could be defined early and the entries would not change, but could be added to.

Level would change with each new experimental representation of data.

A standard of this type must be defined by a group of packet experts and enforced in some manner. This is no small task, but would greatly increase the utility of packet radio experimentation.

K.O.
K.O. Learner, II K9PVW P.O. Box 5014 Kokomo, IN 46902
Packets via W9ZRX HF/VHF to K9OPO for hand delivery.

